

# **The Effects of Chronic Pain on Intimate Relationships**

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## **Abstract**

Past research has demonstrated that chronic pain is associated with depression, limitations in functioning, and coping styles. These variables were examined as possible moderating factors between chronic pain and relationship satisfaction in a sample of patients suffering from Occupational Overuse Syndrome (OOS), a chronic pain condition. A sample of couples with no health concerns was included in the study to determine whether the observed effects were due to the chronic pain. In order to differentiate the specific effects of chronic pain and a chronic health condition per se, a sample of diabetes patients and their partners was also examined. The results indicated that relationship satisfaction was lower in couples where one person had chronic pain or a chronic health condition than in those without one. Depression and passive coping strategies were higher in chronic pain and diabetes patients than in the other participants. Within couples where one member had a chronic health problem, both patients and their partners were found to use less active coping strategies than those couples where neither had a chronic health issue. Chronic pain patients were more impaired on multiple areas of functioning than diabetes patients.

Higher relationship satisfaction in chronic pain patients was strongly associated with lower depression in themselves and their partner, less impairment in social functioning and a greater impairment in communication, along with less use of passive coping by themselves and more use of passive coping by their partners. Better relationship satisfaction in chronic pain partners was associated with lower depression in themselves and the patient, more use of active coping by themselves and the patient, more use of passive coping by themselves and less use of passive coping by the patient. None of these variables were strongly associated with relationship satisfaction in the diabetes and control couples.

The best predictors of relationship satisfaction in chronic pain patients were impairments in social and communication functioning, along with their partners' level of depression and passive coping strategies. The chronic pain partners' own level of depression and passive coping strategies were the best predictors of their relationship satisfaction. Implications of these findings for couples in which one partner has chronic pain are discussed, along with possible treatment options.

## 1. Introduction

### 1.1 Relationships

Almost all people become involved in intimate relationships at some point in their lives. In Western countries, over 90% of the population marry by age fifty. Even among those who choose not to marry, the vast majority engage in “marriage-like” relationships by living together in committed couple partnerships (McDonald, 1995; cited in Halford, Kelly & Markman, 1997). When relationships succeed, they can be the most meaningful aspect of a person’s life. A strong satisfying relationship provides a centre of “belonging” to each partner’s lives and a buffer against life’s hardships. Conversely, when relationships fail they can produce “misery beyond expectation” (Halford et al., 1997, p.3).

#### *1.1.1 Relationship Satisfaction*

Almost all couples who marry report high levels of satisfaction early in their relationship. However, for many couples these high levels of relationship satisfaction decrease over time, and many seek divorce (Halford et al., 1997). Approximately half of all first marriages end in separation or divorce (Bradbury, Johnson, Lawrence & Rogge, 1998). Many other couples live in stable but unhappy relationships (Kaiser, Hahlweg, Fem-Wolfsdorf & Groth, 1998).

Research has shown that relative to couples who experience erosion of relationship satisfaction, couples who remain happy are characterised by undertaking more pleasurable activities together, having better communication and conflict management skills, thinking more positively about their partners and having more positive relationship schemata (Halford et al., 1997). Moreover, the characteristics of couples that sustain long-term satisfied relationships are not the same as the initial determinants of attraction or commitment to relationships (Halford et al., 1997).

A key characteristic of long-term couple relationships is that they adapt to changing life circumstances. A couple who meet when they are young and enjoy partying and playing sports will have to adapt to a different lifestyle ten years later,

when they are married with a number of young children. Thus, while common activities and physical attraction may bring the couple together, it is the ability to communicate effectively, to resolve conflict and to continue to develop new shared activities over time that is likely to determine whether the couple stay satisfied with the relationship (Halford et al., 1997).

### *1.1.2 Relationship Satisfaction and Stress*

Research has also demonstrated that major life stressors and daily stressors take their toll on relationship satisfaction. For example, several studies have shown that daily stressors are associated with negative marital interactions (Christensen & Walczynski, 1997). Two mechanisms have been proposed to account for this. Firstly, stress is liable to increase each partner's need for support while simultaneously decreasing their ability to provide it. Secondly, stressful events may create distortions in cognitive processing and a greater self-focus, which make stressed partners less available to understand and appreciate each other's point of view (Christensen & Pasch, 1993).

### *1.1.3 The Stress Exerted by Chronic Illness on Relationships*

One stressful life circumstance that may necessitate adaptation within a relationship is the development of a chronic health condition in one of the partners. It has been shown that physical illness exerts stress upon intimate relationships and that relationship distress in turn has negative effects on many illness processes (Schmaling & Sher, 1997). The present study will focus on the former; that is, the effect of physical illness on intimate relationships.

It is not surprising that stress is placed upon relationships where one or both partners have a chronic illness, when one considers that all chronic health conditions can affect multiple areas of functioning. Such couples may face changes in their roles, responsibilities and boundaries along with separation from family, friends and other sources of positive support. They may also encounter disruption of long-term plans, assaults on their self-image and self-esteem, uncertain and unpredictable futures and distressing emotions (for example, anxiety, depression, resentment, and feeling of

helplessness). In addition, the couple may need to cope with illness-related factors in the patient such as permanent changes in physical appearance or bodily functioning, and sexual difficulties (Turk, 2000).

Because such a large set of adjustments is demanded, one might expect that a chronic illness in one or both partners would inevitably result in significant emotional difficulties and relationship breakdown. However, some couples do adjust and transcend the effects of stress related to the experience of chronic illness (Turk, 2000).

*Psychological reactions to chronic illness.* One reason for this may be that the association between health and relationship satisfaction is not uni-dimensional; there are important moderating factors. The first of these involves the psychological reactions of both the patient and partner to the illness. It has repeatedly been demonstrated in the literature that the onset of chronic illness is often accompanied by adverse psychological reactions such as depression, in both patients and in partners (Schmaling & Scher, 1997). A consistent association has also been found between marital dysfunction and depression (Gottlib & Hammen, 1992). Couples in which one of the partners has a mood disorder report less marital satisfaction than couples in which neither has a history of mood disorder (Davison & Neale, 1998). For example, Ulrich-Jakubowski, Russell and O'Hara (1988) found that the marriages of depressed persons often result in increased conflict, low marital satisfaction, low availability and inadequacy of the affectional relationship between spouses.

*Coping and chronic illness.* Coping is a 'stabilising factor' that can help individuals maintain psychosocial adaptation during stressful periods. It encompasses cognitive and behavioural efforts to reduce or eliminate stressful conditions and is associated with emotional distress (Holahan, Moos & Schaefer, 1996). Cognitive appraisal has been divided into two phases. Primary appraisal consists of the individual evaluating whether a particular encounter with the environment is relevant to his or her well-being. Secondary appraisal is the individual deciding in what ways the encounter is relevant and what, if anything, can be done about it (Lazarus & Folkman, 1984; cited in Maes, Leventhal & DeRidder, 1996).

Primary appraisal assesses the personal meaning of an event and indicates whether the event or the stressor has positive, neutral, or negative meaning for the individual. Positive emotions result if the interpretation is positive (for example, the stressor may be seen as a challenge); negative emotion results if the stressor threatens the physical and/or psychological self (which is to be expected in the case of events related to chronic illness; Maes et al., 1996)

Therefore, it can be seen that the couples' method of coping with a chronic health problem is another important moderating factor in the adjustment of their relationship to the illness. Research has consistently demonstrated that patients who stay active and distracted from their health problem have more favourable outcomes, both physically and mentally (Schmaling & Scher, 1997). In turn, like depression, coping and marital satisfaction are thought to be related. For example, marital dissatisfaction has been found to be associated with poor coping and increases in sickness-related absences from work, smoking and alcohol consumption (Hallberg & Mattson, 1992).

*Degree of impairment.* In addition to the moderating effects of depression and coping, the degree of impairment caused by the health problem appears to be important. Some research has found that the degree of functional impairment is not necessarily related to relationship satisfaction (Schmaling & Scher, 1997). However, Ahern, Adams and Follick (1985) found that 35% of couples in one study were maritally dissatisfied; this was related to self-reported impairment in social interactions, suggesting that the type of functional impairment may be relevant.

#### *1.1.4 Focus of the Study*

In order to extend research in this area, the present study has focused on chronic pain (as a feature of chronic illness), specifically examining its effects on relationship satisfaction. Also, from the current literature it was clear that the present study needed to examine the moderating factors listed above (depression, coping



styles and functional impairment) in order to fully explore the interaction between chronic pain and relationship satisfaction.

Couples in which the female partner suffers from chronic pain were compared with couples where the female partner has diabetes (a control for exposure to a chronic health condition) and with couples with no health concerns. The couples (both partners) were tested on measures of relationship satisfaction, depression and coping. The extent of functional limitation caused by their disorders was also examined in the pain and diabetes patients.

Couples in which the female partner has diabetes were chosen as a comparison group because of the similarities in psychosocial factors between diabetes and chronic pain.

Diabetes mellitus is a chronic endocrine disorder characterised by abnormalities in the production and/or utilisation of the hormone insulin. Insulin, which is produced by pancreatic beta cells, is essential for the utilisation and storage of nutrients by the body. It can have fatal consequences if left untreated, and is associated with serious long-term health complications (Gonder-Frederick, Cox & Ritterband, 2002).

Chronic pain and diabetes have both been associated with a higher prevalence rate of depression compared with the general population (Lustman, Clouse & Alrakawi, 1997; cited in Gonder-Frederick et al., 2002), increased psychological distress and a poorer quality of life. Little research has focused on relationship satisfaction in diabetes patients; however, one study found that spouses of patients reported increased levels of worry and distress, diabetes-related marital conflict, and sleep disruptions (Stahl, Berger, Schaechinger & Cox, 1998, cited in Gonder-Frederick et al, 2002). It was considered that more would be learnt about the *specific* effects of chronic pain if the comparison group in this study also contained a chronic condition with associated psychosocial factors.

In order to further explore the potential effects of chronic pain on relationships, the remainder of the introduction defines chronic pain and the various

models used to explain it. Occupational Overuse Syndrome (OOS), the chronic pain syndrome used for subjects in this study, is also examined. The interactions between chronic pain and a number of psychosocial factors are discussed and finally hypotheses regarding the effects of chronic pain are proposed.

## **1.2 Chronic Pain**

Studies of chronic health problems and associated psychological factors have examined coronary heart disease, cancer, rheumatoid arthritis, diabetes, fibromyalgia and a host of others. However, one of the fastest growing research areas is that of pain. There has been an explosion of knowledge in the past decade regarding the underlying neuroanatomical pathways and the neurophysiological mechanisms of pain, along with the contributions of psychosocial factors to the pain experience (Turk & Okifuji, 2002). Moreover, the next decade has been designated “The Decade of Pain Control and Research” by the US Congress (Turk & Okifuji, 2002).

### *1.2.1 Description of Chronic Pain*

Pain as an entity has generally been divided into two types. Acute pain is defined as pain lasting six months at the most (and usually less). It usually results from obvious tissue damage, such as a burn, cut, or broken bone. Acute pain is predominantly treatable with analgesics and disappears as the injury heals (Allen, 1998). Typically, there is intense emotional distress at the time of injury, which quickly fades as the pain is treated (Allen, 1998).

Chronic pain has been defined as pain that lasts for more than six months, or pain lasting beyond the normal time for healing (Rice, 1998). It may begin with acute pain, or develop gradually, depending on the cause (Allen, 1998). There are at least three subtypes of chronic pain, (Schwartz & Ehde, 2000), usually classified according to aetiology.

(1) Some people may have an identified, ongoing disease process that results in pain (e.g., chronic pancreatitis or cancer).

- (2) Others may have clear evidence of tissue damage or injury to the peripheral or central nervous system (e.g., causalgia or post-amputation pain).
- (3) For many people with chronic pain, the underlying cause is either undetectable by current diagnostic procedures, or the level of established organic pathology cannot fully explain the pain symptoms or level of disability. Examples of this third subtype include chronic low back pain, fibromyalgia and chronic headache (Schwartz & Ehde, 2000).

Given that the emotional distress suffered by people with acute pain is typically brief and limited to six months at the very most, (that is, the duration of pain) the focus of the present study is on chronic pain and its debilitating effects, which will be outlined below.

It is not surprising that the next decade has been designated “The Decade of Pain Control and Research” (Turk & Okifuji, 2002) due to the scale of the problem. One group of researchers found that more than a fifth of patients treated by health clinics in 14 different countries suffered from chronic pain (Gureje, Von Korff, Simon & Gater, 1998). Gureje et al. studied 26,000 patients between 18 and 26 in Asia, Africa, Europe and the Americas. They discovered that, overall, 22% of primary care patients reported persistent pain. Nearly half reported recurring headaches, backaches or joint aches and 68% of these had chronic discomfort in two or more body sites. Allen (1998) reported that an estimated 20% of American adults suffer persistent pain and that the total cost of chronic pain conditions in terms of healthcare services, loss of productivity, compensation and related factors in 1990 was around \$30 billion annually. Turk (1994) reported that costs exceed \$70 billion per annum in the USA, and indicated that healthcare costs are steadily increasing.

### *1.2.2 Models of Chronic Pain*

There are several conceptual models of chronic pain (Schwartz & Ehde, 2000). These are important to examine given that chronic pain is sometimes seen as a purely “medical” problem (that is, something one would go to the doctor for), and distinct from any relationship issues experienced by chronic pain sufferers. These may

be seen as an interpersonal problem that one might talk about with friends or a counsellor, not necessarily related to the pain issue.

While some people contend that this distinction is usually accurate, the models cited below emphasise the role of psychosocial factors over and above the organic pathophysiology of pain. Even more crucial is the fact that chronic pain and psychosocial factors can both influence and be influenced by each other.

The biomedical model assumes that pain results from a specific disease-state or process. Psychosocial factors are viewed as reactions to pain rather than contributing factors. The model states that symptoms are either psychogenic or organic, despite a lack of empirical evidence for this dichotomy (Schwartz & Ehde, 2000).

*The gate control theory.* The gate control theory of pain, which was proposed by Melzak and Wall in 1965 (cited in Grant & Haverkamp, 1995), radically changed the way that clinicians and researchers thought about pain (Schwartz & Ehde, 2000). This theory hypothesised the existence of a neural “gate” mechanism which allows pain sensation to pass to higher brain centres at some times and which suppresses it at others. Not only do nerve impulses travel to the brain from the injury area, but other psychological and socio-environmental factors can also stimulate or inhibit neural messages. These messages were proposed to either close or modulate the gate mechanism and consequently pain perception (Grant & Haverkamp, 1995). This model included a physiological basis for psychological factors in pain perception, and also emphasised that there is not a one-to-one relationship between organic pathology and pain symptoms (Schwartz & Ehde, 2000). However, it gave no direct attention to the role that the socio-environmental context may play in the experience of chronic pain (Turk, Flor & Rudy, 1987).

*The behavioural model.* Another model recognising the role of psychological and social factors in chronic pain was proposed by Fordyce, Fowler, Lehmann and DeLateur (1968). They suggested that operant conditioning explains some of the

behaviours typically exhibited by chronic pain patients. Fordyce's model was based on the premise that behaviours typical of the chronic pain patient (inactivity, medication request, medication consumption, etc) are reinforcing by the environment and other individuals (e.g., their partners). Behaviours have consequences and if these consequences can be characterised as favourable, the behaviours eliciting them will tend to be reinforced. It is not suggested that pain is produced by operant conditioning, but rather that pain is attended by certain behaviours and these behaviours are subject to specific influences, such as operant conditioning, over time (Horn & Munafo, 1997).

Fordyce (1976; cited in Brantley & Ames, 2001) proposed that a distinction be made between the original cause of pain and the reports or displays of pain. These are known as pain behaviours and can include limping, grimacing and groaning. As with any other type of behaviour, if the pain behaviours are followed by reinforcing consequences they may persist for longer than the expected healing time (Sharp, 2001). Additionally, pain behaviours may be maintained by negative reinforcement because they allow the individual to escape from undesirable activities such as work. Finally, normal "healthy" behaviour may not be adequately reinforced, so that coping or health-promoting behaviours cannot compete with pain behaviours, thus maintaining the pain behaviours (Brantley & Ames, 2001).

Fordyce (1988) maintained that distinctions between pain, suffering and disability are essential for the evaluation and management of chronic pain. He described pain as being "a sensation arising from the stimulation of perceived nociception" (p.278), with some exceptions, (e.g., phantom limb pain). Suffering, including pain behaviours, was defined as "an affective or emotional response in the central nervous system, triggered by nociception, or other aversive events such as the loss of a loved one, fear, or threat" (p.278). Events perceived as indicating probable or possible threat or loss are likely to elicit suffering behaviours. Past suffering may also affect the person, because they are likely to anticipate the effect of such events in the present and the future. Therefore Fordyce asserted that it is important to distinguish between pain/nociception as a signal system and suffering/pain behaviour as a set of responses that blend past experience and anticipations with the perceived stimuli.

Disability is the impairment due to a disorder suffered by an individual, in carrying out their life roles and is “a legal or social judgement, based in part on medical judgements” (Fordyce, 1988, p.276). Fordyce stated that suffering is often confounded with disability, leading to unnecessary disability. He based his arguments on the fact that the incidence of conditions such as back pain has been shown to correlate with the rate of award of disability status. Moreover, treatments that prescribe rest and disuse of muscles can result in excessive disability and more suffering than would otherwise occur. He maintained that patients must be taught that pain and suffering is not the same thing: “that one hurts on moving does not necessarily mean that healing has not occurred or that residual injury is present... the familiar dogma that pain is a warning signal is often untrue” (Fordyce, 1988, p.282).

*The biopsychosocial model.* The biopsychosocial model extends this behavioural theory to conceptualise chronic pain as the result of the complex interaction of biological, psychological, and social variables. These factors interact in a dynamic process, which affects a person’s experience of pain and can account for the diversity often seen in personal expression of and response to pain (Schwartz & Ehde, 2000). Again, this is partly due to the fact that the very nature of chronic pain (its extension over time) presents the opportunity for psychological, social and behavioural factors to mediate the individual’s response to their condition (Horn & Munafo, 1997).

Biological factors in the biopsychosocial model can include the pathophysiology of the pain itself and also physical factors such as muscle tension, muscle deconditioning and atrophy (Grant & Haverkamp, 1995). This atrophy often results from avoidance of activities that are perceived to produce pain, including physical movement and exercise (Philips, 1987).

The first of two major sets of psychological variables in the biopsychosocial model is that of cognitive factors. They are important because people are not passive responders to physical sensations, but actively seek to understand and make sense of their experience (Grant & Haverkamp, 1995). Studies of cognition and pain have included a number of variables such as memory, coping style, self-efficacy, locus of control, fear/anxiety and depression (Horn & Munafo, 1997). Research has found that



a high incidence of catastrophising thoughts, maladaptive coping mechanisms and beliefs that the disease is incurable are related to higher distress, avoidance beliefs regarding physical activity and work and memory biases (Horn & Munafo, 1997).

Understanding of the chronic pain experience is influenced by two main factors: (1) the clients' understanding of the pain itself and (2) their beliefs about personal coping abilities (Grant & Haverkamp, 1995). For example, Williams and Thorn (1989) found that people who believed pain was a poorly understood mystery had lower self-esteem, increased levels of somatisation, increased psychological distress and poorer treatment compliance when compared with people who understood their pain. Research has also found that beliefs about the ability to control pain can influence predictions of pain tolerance, the ability to perform certain physical movements, psychological functioning and pain levels. It can also account for some of the variations in pain treatment response (Grant & Haverkamp, 1995). However, the direction of causality between pain and cognitive factors is not always clear. Pain may contribute to or confirm a sense of helplessness or a tendency to engage in catastrophic thoughts (for example, that the suffering is unalterable), and may in turn be exacerbated by them (Horn & Munafo, 1997).

The second main set of psychological variables in the biopsychosocial model of pain is the set of emotional factors, which can also affect coping abilities. For example, the inability to find a medical solution to a problem can lead to despondency, a sense of helplessness and pessimism (Turk & Holzman, 1986; cited in Grant & Haverkamp, 1995). Furthermore, many chronic pain patients will see numerous doctors, specialists and alternative health practitioners and spend a great deal of time and money without finding relief. At times, pain patients also encounter rejection because of the negative stereotypes that healthcare providers might hold about them (Allen, 1998). Not surprisingly, anxiety and depression can lead to a decrease in coping abilities, social and recreational activities and an increase in pain intensity, which in turn can cause further anxiety and depression (Grant & Haverkamp, 1995).

Finally, the behaviour of a pain sufferer is shaped by his or her social environment. This relates to the behavioural model mentioned above. A number of

studies have demonstrated that cultural beliefs affect the way pain is perceived, labelled, and responded to, as well as when and what type of treatment is sought (eg. Sargent, 1984; cited in Grant & Haverkamp, 1995). Other studies have demonstrated that the behaviour of a pain sufferer is shaped by significant others. For example, some researchers have found that high levels of social support, spousal solicitousness and marital satisfaction are correlated with lower levels of psychological distress and medication intake (Manne & Zautra, 1989). Contrastingly, others have correlated spousal solicitousness to higher pain levels and lower levels of activity (Flor, Kerns & Turk, 1987).

### *1.2.3 The Complexity of Chronic Pain*

Thus, it can be seen that pain perception and experience is a complex phenomenon. It is influenced by biological, psychological and social factors that combine and interact in ways unique to a given individual (Grant & Haverkamp, 1995). The theories above emphasise the role of psychological factors in mediating pain response, particularly in chronic pain patients. This does not deny the existence of a nociceptive element in the condition of chronic pain patients. Instead, it is argued that acute pain and chronic pain lie at extremes of a temporal dimension of pain, with different factors varying in importance at different points along this continuum (Horn & Munafo, 1997). This is why the psychological and social factors outlined above are usually less important in acute pain. Understanding these models enables one to see that the existence of chronic pain can impact on relationship satisfaction, by inducing a variety of psychosocial changes.

As mentioned previously, some types of chronic pain cannot be adequately explained by current medical science (Schwartz & Ehde, 2000). When this is the case, cognitive and emotional distress may be exacerbated (eg. Horn & Munafo, 1997; Williams & Thorn, 1989; Turk & Holzman, 1986; Allen, 1998). One example of a common chronic pain disorder that has not been adequately explained pathophysiologically is Occupational Overuse Syndrome (OOS).



Because it was assumed that a disorder associated with a large amount of cognitive and emotional distress would impact on relationship functioning, people with OOS were selected as the chronic pain subject group in this study.

### **1.3 Occupational Overuse Syndrome**

OOS is a collective term for a range of conditions characterised by discomfort or persistent pain in muscles, tendons, and other soft tissues (A-Z of Health, 2001). It can include a range of hand, wrist, forearm, elbow, neck, shoulder, back, hip, knee and ankle disorders (Arksey, 1998). OOS is referred to as Repetitive Strain injury (RSI), Work Related Upper Limb Disorder (WRULD), Upper Limb Disorder (ULD), and Cumulative Trauma Disorder (CTD) in other parts of the world (Arksey, 1998). OOS is a complex disorder and may also involve structures other than muscles, such as nerves and blood vessels; however, aching muscles are the major symptom (A-Z of Health, 2001).

OOS usually occurs from a repetition of small, sometimes unfelt injuries. This can cause an injury to develop gradually over weeks, months, or even years. There are five main causes of OOS (A-Z Health, 2001): repetitive movements, abnormal postures, repeated forceful movements, extremes of joint range and fatigue.

#### *1.3.1 Stages of OOS*

The symptoms can be divided into three main stages (A-Z Health, 2001). Acute OOS, or Stage 1, is characterised by pain, discomfort and at times unusual sensations, and is confined to one particular spot. There is aching and fatigue of the affected limb while at work (Mullaly & Grigg, 1988), but the pain goes away when the individual takes a break from the activity that causes it (A-Z Health, 2001).

Stage 2 occurs between the acute and chronic stages. Here, the individual may suffer chronic symptoms followed by a reasonable level of recovery (A-Z Health, 2001). It is characterised by recurrent aching and fatigue which begins shortly after

the start of work, persists for longer than the duration of work and may be accompanied by swelling and inflammation (Mullaly & Grigg, 1988).

Chronic OOS, or Stage 3, is characterised by many symptoms. The individual experiences constant pain of more than one variety. This is accompanied by chronic fatigue as a result of functioning with pain and the body's reduced ability to respond to activity. Pain occurs while at rest and during non-repetitive movement (Mullaly & Grigg, 1988), and can disrupt sleep patterns and other activities involved in daily life. Like other chronic pain disorders, sufferers frequently have to undergo considerable emotional adjustment in response to the trauma of developing a disability that affects all aspects of their lives. Depression and grieving are natural responses to this type of trauma. While sufferers are often socially isolated in the initial stages of OOS, the following adjustment period is also highly stressful to partners and family (A-Z Health, 2001).

### *1.3.2 History and Prevalence of OOS*

Contrary to popular opinion, OOS is not a “new” condition. Upper limb pain in scribes and notaries was described by Ramazzini in the early 18<sup>th</sup> century, and was attributed to constant use of quill pens for writing, poor seating and ‘excessive mental labour’ (Reilly, 1995). During the 19<sup>th</sup> and early 20<sup>th</sup> centuries massive outbreaks of arm pain were attributed to the introduction of new technology. “Writers’ cramp” was followed by an epidemic of “telegraphists’ cramp” in both America and Britain. An extensive study was made, and the report of the Departmental Committee of Telegraphists’ Cramp in 1911 (cited in Reilly, 1995) described telegraphists’ cramp as due to a combination of “nervous instability” on the part of the operator, and “repeated fatigue” during the complicated movements required for sending messages. Many occupational disorders were felt to be examples of neurosis (Reilly, 1995), and in some people’s opinions, still are.

Further outbreaks of occupationally related muscle weakness and pain were reported sporadically within industrialised countries over the next 60 years. In the early 1980s a major epidemic of arm and neck pain occurred in Australia (Tyrer, 1994). These symptoms were thought by occupational physicians to be due to new

work practices and were believed to be a form of Tenosynovitis. The workers' unions were alarmed and publicised the condition, encouraging early reporting of symptoms arising in the arm and neck. Almost 4000 reports of OOS were made between 1981 and 1985, after which the incidence declined (Tyrer, 1994).

Mullaly and Grigg (1988) reported that affected workers in both Australia and overseas studies included typists, VDU and data processing operators, cash register operators, telephone exchange operators, packing machine operators, key punchers, film rolling workers, sewing machinists, bank-note counters, accounting machine operators, assembly line workers and clerical workers who did not regularly use equipment. Women appeared to be over-represented in the statistics, for which the most likely reason was their concentration in at-risk occupations.

OOS is still a widespread problem in New Zealand. In the year ending March 31 1989, the Accident Compensation Corporation (ACC) paid out \$16.5 million in compensation to 6200 sufferers (A-Z Health, 2001). OOS is now the most claimed-for condition and the leading compensatable cause of absence from work (Arksey, 1998). It can lead to weeks or months, sometimes years, off work, with financial and personal costs to sufferers and their families and disruption in their workplaces (Bammer & Blignaut, 1988).

### *1.3.3 Etiological Theories of OOS*

As noted above, there are opposing views as to whether OOS exists as a clearly defined medical condition with determinable causes (Arksey, 1998). A popular view of OOS is the medical/ergonomic explanation that it is a soft-tissue disorder caused by the overloading of particular muscle groups from repetitive use or the maintenance of constrained posture (National Occupational Health and Safety Commission, 1985; cited in Mullaly & Grigg, 1988).

This "standard" view of OOS emerged principally from three Sydney doctors; a rheumatologist, a physician specialising in rehabilitation medicine and a hand surgeon (Browne, Nolan & Faithful, 1984). This group published a paper claiming

that pain and disability connected to OOS-type conditions have an organic basis, reflecting the orthodox medical model of disease and injury. They described OOS as musculo-tendinous injuries of the upper limbs, shoulder girdles and neck. This cause follows that cited by the above-mentioned National Occupational Health and Safety Commission (Browne et al, 1984).

The medical/ergonomic explanation was not universally accepted (Mullaly & Grigg, 1988). A common thread among critics was the belief that OOS was not organic in origin, was not work related, or in fact was neither (Arksey, 1998). Mullaly and Grigg (1988) pointed out that the major problem with the medical argument was its failure to answer a fundamental question. Given similar working conditions, why do some individuals develop OOS while others do not? While the answer may be provided in part by physiological predisposition, these researchers stated that there is a good deal of support in the literature to implicate psychological factors as well.

Examples of psychological theories of OOS range from the somewhat ridiculous to the theoretically plausible. For example, Ireland (1986) was an orthopaedic surgeon who advocated a malingering model. He alleged that people with musculoskeletal conditions deliberately present with symptoms which they are feigning with the intention of gaining concessions such as compensation benefits, work absence and so on.

Similar to this (but not quite as derogatory) was a theory by Luciere (1986), a forensic psychiatrist from Australia (Arksey, 1998). She was a strong proponent of the view that OOS is a conversion disorder in which the loss of physical functioning is entirely due to psychological conflict. She has claimed that there were no demonstrable organic findings to explain the symptoms of OOS. The symptoms were said to be symbolic of the suppressed rage of the powerless and dependent, directed toward their supervisors, employers and spouses. The pain symptoms absorb the anxiety brought about by the conflict, providing the primary gain. The secondary gain is in the avoidance of aversive activity and the increase in environmental support (Luciere, 1986).

A less extreme view was put forward by the Australian Task Force Report (1985), which associated the incidence of OOS with the social context of work, for example the supervisor's style and power relations; attitudes to the job, and stress responses to work. Similar findings have been documented in the research literature. For example, Nall and Thomas (1986; cited in Mullaly & Grigg, 1988), using the National Heart Foundation "Type A" Personality Inventory and the Spielberger State Trait Anxiety Inventory, found that OOS sufferers were more likely than controls to show elevated type A and anxiety scores.

The major flaw with such studies is that they mostly described psychological states *after* the person had been injured. It is impossible, therefore, to tell whether the psychological condition contributed to the experience of pain, or vice versa (Mullaly & Grigg, 1988).

More recently, people have started to realise that more than one factor may account for the development of OOS. For example, Rosenham and Seligman (1984) were the first to claim that the musculoskeletal system is a site for a psychophysiological disorder. They described the diathesis-stress model in which it is proposed that an individual develops psychophysiological illness when he or she has both a physical vulnerability (diathesis) and psychological disturbance (stress). Given the demonstration of a relationship between stress and OOS in the literature, it is widely accepted that OOS may be a psychophysiological disorder (Mullaly & Grigg, 1998).

Because there is no definitive explanation for OOS, the present study will conceptualise OOS according to the biopsychosocial model. As mentioned above, an organic basis has been hypothesised, that it is a soft tissue disorder (Mullaly & Grigg, 1988; Browne et al, 1984). However, there is a good deal of research in the literature to support the importance of psychological factors such as anxiety levels and personality variables and attitudes for development and maintenance of OOS (for example, Luciere, 1986; Nall & Thomas, 1986; Rosenham & Selligman, 1984). In addition to personal characteristics, the Australian Task Report (1985) associated the incidence of OOS with the social context of work. It is likely that, as with other

chronic pain disorders, both psychological and social factors interact with the pain, influencing it and being influenced by it.

#### **1.4 Psychosocial Factors and Chronic Pain**

The psychological and social factors mentioned in the last section will now be reviewed, with a particular focus on the moderating factors between pain and its potential impact on close relationships (depression, functional limitations and coping).

Because there is a dearth of literature regarding specific psychosocial influences on OOS, the factors discussed will be related to a range of chronic pain disorders. While some researchers have asserted that pain in specific anatomical locations, (e.g., head, neck, shoulder and back) is less serious than diffuse bodily pain (e.g., fibromyalgia) there has been no consensus on this point (Monsen & Havik, 2001). Moreover, it has long been recognised that physical pathology does not predict pain severity and that different people respond in varying ways to chronic pain (Sharp, 2001). One study found that many people with “abnormalities” identified by MRI scanning (e.g., disc bulges), did not report back pain, while many people complaining of back pain had no identifiable pathology (Jensen, Brant-Zawadski, Obuchowski, Modic, Malkasian & Ross, 1994; cited in Sharp, 2001). Thus, the specificity of the association between physical impairment and reports of pain appears to be moderate at best.

In spite of the variability of its impact, persistent pain generally tends to be debilitating. Many sufferers grieve for the loss of the active life they once had and worry about possible medical causes for their suffering. Sleep disturbance is common among chronic pain patients and may have independent negative effects on personality and coping ability. The realisation that the medical profession has been unable to ease the pain can be disturbing, while challenges to the legitimacy of their complaints may be a major source of stress (Allen, 1998).

The problems produced by pain can be similar to those for which people seek counselling. These include depression, fear regarding future disability, frustration, anger, decreased activities and pleasure, isolation, a sense of helplessness and medication addiction (Grant & Haverkamp, 1995).

It is not surprising then that adjustment to chronic pain tends to be a difficult process. While the nature and severity of physical illness or injury and the degree of pain experienced obviously influence the difficulty of adjustment, these factors alone account for only 25% of the impact of chronic pain (Spence, 1993). This highlights the importance of psychosocial factors. For example, Burton, Tillotson, Main and Hollis (1995), found that psychosocial factors accounted for 59% of the variation in disability associated with chronic pain. Psychological factors have also been reported to be predictive of pain severity, emotional distress and treatment seeking (Turk & Okifuji, 2002)

#### *1.4.1 Depression*

It has already been noted that depression is an important moderating factor between chronic pain and its effects on intimate relationships. One of the reasons for this is the strong relationship between chronic pain and depression. Depression is an emotional state marked by great sadness and apprehension; feelings of worthlessness and guilt; withdrawal from others; loss of sleep, appetite, and sexual desire and loss of interest and pleasure in usual activities (Davison & Neale, 1998).

A great deal of research has been conducted on the existence and incidence of psychiatric disorders among chronic pain patients. One study of 200 people with chronic low back pain (Polatin, Kinney, Gatchel, Lillo & Mayer, 1993; cited in Schwartz & Ehde, 2000) found that 59% had current symptoms and 77% met the criteria for at least one psychiatric diagnosis. Lindal (1990) conducted research that found a significantly higher frequency of depression among chronic pain patients than healthy patients. Lee, Giles and Drummond (1993) found that as in most other chronic pain conditions, patients with whiplash injuries were more depressed and anxious than healthy controls. Flor et al (1987) indicated that rates of clinical depression or major



depressive episode (MDE) in patients with chronic pain were approximately 30% to 40%, three to four times higher than in the general population.

Although estimates of prevalence vary widely, it is clear that there is an association between pain and depression. However, the causal relationship between pain and depression remains unclear; that is, does depression cause pain or is it an outcome of discomfort?

There have been two main hypotheses concerning the timing and relationship of depression to chronic pain (Fishbain, Cutler, Rosomoff & Rosomoff, 1997). These are (1) the antecedent hypothesis (depression precedes the development of pain); and (2) the consequence hypothesis (the depression is a consequence and follows the development of pain). Fishbain et al. (1997) conducted a review of 191 pain-depression studies and found that there was more evidence for the consequence hypothesis than the antecedent hypothesis.

On the other hand, mood has been found to have a direct effect on how people evaluate their health. In a study by Croyle and Uretsky (1987; cited in Skevington, 1995), videos were used to induce positive or negative mood and participants were then invited to imagine an illness-related scenario. It was found that those who had been in a positive mood produced more favourable judgements of their health than those in a negative frame of mind. A subsequent study demonstrated that as negative mood increased, people gained greater access to illness-related memories (Skevington, 1995).

These contradictory findings emphasise the need for more longitudinal research in the chronic pain area. While it is beyond the scope of this thesis to investigate causal relations between chronic pain and depression, it is clear that this is an issue that requires attention from researchers<sup>1</sup>. Further investigation into causality may also help to clarify which theories (discussed below) best explain the association between chronic pain and depression.



Several theories have been posited about depression as a concomitant of chronic pain. For example, Price (1991) suggested that depression evolved as a mechanism for inhibiting challenge in social groups. Depressed mood induces the adoption of the 'loser' role in social competition, the one-down position in a complementary relationship. In the sick role (for example that of a chronic pain sufferer), the message conveyed to those seen as adversaries is "I am sick and therefore no threat to you", and to supporters, "I am sick and therefore out of action; stop pushing me into the arena to fight on your behalf". The function of these messages is to inhibit challenge from adversaries and elicit nurturant support from close others.

Some authors have conceptualised chronic pain as masked or somatised depression. For example, Blumer and Heilbronn (1981) hypothesised that mood disturbances are so common in pain patients that chronic pain may be merely another form of depression. Depressed people are also likely to be more self-absorbed in what is described as a "heightened level of self-focused attention" (p.235), maintaining the depression (Skevington, 1995). This also has implications for the maintenance of chronic pain, as the pain would become the patient's main focus rather than events happening external to the self.

Other investigators (e.g., Kleinman, 1988) have questioned how much depression is a psychopathological versus a normal reaction to a difficult situation. That is, "depression" may really be a description of a life affected by pain and persistent disturbances of sleep, energy and appetite. Guilt, low self-esteem and thoughts about death may be directly linked to this experience of pain.

It seems likely that the association between chronic pain and depression varies according to the individual and to the extent to which the disorder impacts upon their life. However, the implications on relationship satisfaction are clear and depression invariably has a negative effect on the quality of a couple's relationship (Cordova & Jacobson, 1997).

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<sup>1</sup> See the Discussion section for more information about issues concerning cross-sectional versus longitudinal research in the chronic pain area.

### 1.4.2 Functional Limitations

Another important moderating factor between chronic pain and its effects on intimate relationships may be the degree of impairment or disability caused by the pain disorder.

Disability has numerous definitions. Fordyce's (1988) distinction between pain, suffering and disability has already been outlined above. Another example is the World Health Organisation's *International Classification of Impairment, Disabilities, and Handicaps* (ICIDH; World Health Organisation, 1980; cited in Bruce, 2000, p.13). Disability is defined as "a restriction or lack, resulting from an impairment, in the ability to perform an activity in the manner considered normal for a human being (e.g., activities of daily living, mobility)". Thus, functional limitations are "manifestations of impairment translated in terms of function" (Vasudevan, 1992, p.102; cited in Eimer & Freeman, 1998).

Most models of disability hypothesise a relationship between physical disability and disability in other domains such as social function, role function and employment function (Bruce, 2000). Chronic pain is a prime example of this kind of disability, given that it is frequently accompanied by changes in physical, emotional, social and vocational functioning. (Schwartz & Ehde, 2000) have posited that individuals suffering chronic pain often experience numerous changes in their lifestyle

More specifically, functional impairments can include a number of losses; job and income, mobility, energy, comfort, physical activity, sleep, concentration and memory. There may be an inability to drive and get around on one's own or to carry out specific tasks. People can go from being independent to being dependent, from being healthy to having a chronic condition, from feeling in control of their lives and their bodies to feeling powerless and from feeling sexual desires and energy to feeling chronic fatigue and loss of desire (Kelley, 1998).

Loss of a social life is another factor that is commonly reported in pain patients. This can be associated with many factors: low energy level, an inability to plan ahead and host activities, not being able to do some activities such as sports and friends not understanding the pain and the associated limitations (Kelley, 1998). Moreover, there can be a loss of comfort in social situations, contributed to by memory loss and confusion.

An example of how chronic pain can cause functional limitations was a study conducted in 1985, where an Australian Public Service (APS) report asked individuals how OOS had affected their lives in general. Of the 809 respondents, 15% stated that OOS had adversely affected all aspects of their lives. The most common aspects related to adult interpersonal relationships, parenting skills, sporting activities, social activities, lowered self-esteem, financial strain and extra intake of alcohol or medication (cited in Dorland & Hattie, 1992).

*Functional limitations, pain and depression.* In spite of the fact that chronic pain is known to cause limitation in function, the association between pain and functional impairment is not a clear-cut one. This is because depression has dynamic and reciprocal links with functional limitations (that is, depression can cause a decrease in activities or conversely when limitations are placed on functions a person can become depressed). It is also notable that many functional limitations and symptoms of depression overlap, for example difficulty in sleeping, low energy and decreased socialising.

Because of this, research has been carried out to investigate the associations between pain, functional limitations and depression. Revenson and Felton (1989) studied women with chronic rheumatoid arthritis and found that although pain was a problem, disability contributed in a significant but modest way to their acceptance of illness and the emotions associated with it. Furthermore, as disability increased, so the acceptance of illness decreased and more negative emotions such as depression occurred.

Parmelee, Katz and Lawton (1991) investigated the association between pain and depression in a sample of institutionalised elderly persons. In addition to finding that pain was linearly related to the level of depression, they found that although depression was correlated with functional disability, functional disability did not account for (i.e., did not mediate) the relation between pain and depression. Thus they suggested that among institutionalised older adults, the relation between pain and depression appears to be independent of functional impairment.

However, Williamson and Schultz (1992) found contradictory results in their study of 228 people recruited from geriatric outpatient clinics. They found that pain was positively correlated with activity restriction and depressed affect and that activity restriction was positively related to depressed affect. A path analysis showed that pain had a small direct effect on depression while it directly affected activity restriction. In turn, the strongest direct effect on depression was exerted by activity restriction, therefore demonstrating that the relation between pain and depression was partially attributable to functional impairment.

Williamson and Schultz (1995) replicated these results in older cancer outpatients (mean age 62.4 years). They found that as pain increased over time, so did activity restriction, which in turn predicted increases in depressed affect. Because they were unsure whether this was generalisable over the age span, they also tested a sample of 73 children who were receiving therapy for recurrent pain associated with a chronic disorder. The results were the same as the previous studies. Another study (Williamson, 2000b; cited in Williamson, 2000a) replicated these results in a sample of women with breast cancer (mean age was 49.2 years).

In summary, the authors concluded that this provided strong evidence that activity restriction mediates (either partially or totally) psychological adjustment to a variety of illness conditions, encompassing individuals across the life span (Williamson, 2000a). This research has highlighted the importance of considering depression when examining functional limitations and chronic pain. Given the strong association between pain and depression outlined above and the fact that this may be mediated by activity restriction, it was considered an important variable to include in the present study, especially as the literature outlined above is somewhat unclear.

### 1.4.3 Coping

It has already been mentioned that adjusting to life with chronic pain is an extremely difficult process. How a person copes with it can affect not just the quality of their intimate relationship, but their general quality of life.

Coping has been defined as “what people do to try to control, manage, or tolerate stressful situations, such as severe pain” (Eimer & Freeman, 1998, p.75). Research has indicated that pain patients’ coping strategies are related to several measures of adjustment, including pain treatment outcomes (Eimer & Freeman, 1998). Associations have been described between coping and factors related to health and well-being, such as depression, general health status, and comorbid illness in patients who have chronic pain. Links have also been found between coping and sociodemographic factors in patients with chronic pain. These include age, gender, marital status and education (Mercado, Carroll, Cassidy & Côté, 2000). Moreover, evidence has been found to support an association between coping with pain and factors related to the stressor, such as pain severity and pain disability (Mercado et al., 2000).

*Active and passive coping.* Researchers have classified coping in several ways (Degood, 2000). One conceptualisation draws a distinction between behavioural (or problem-focused) coping, which is overt action taken to deal with stress, and cognitive (or emotion focused) coping, which is the use of mental strategies or ways to use thoughts and feelings to deal with stress (Folkman & Lazarus, 1980). Another distinction (Degood, 2000) classifies the coping behaviour itself as an active or instrumental coping response (for example, attempts to maintain regular activities, using distraction to ignore pain) in contrast to passive coping strategies (for example restricting activity, resting in bed). The two classifications can be combined into active/problem focused coping and passive/emotion focused coping (Horn & Munafo, 1997).

The way in which chronic pain patients cope or adjust to their illness is one of the keys to understanding the great variability amongst patients in their ability to function with and to maintain a quality of life in all areas, including relationship satisfaction (Strahl, Kleinknecht & Dinnel, 2000). A great deal of research has been conducted on coping strategies in chronic pain patients. Active coping (e.g., attempting to maintain activities despite pain) has been found to be associated with more favourable adjustment to illness, while passive coping has been associated with the opposite outcome (Strahl et al., 2000). Brown and Nicasso (1987) found that active coping was associated with less pain, depression and functional impairment and with higher self-efficacy in rheumatoid arthritis patients. Passive coping was linked with more depression, pain and flare-up activity.

Suls and Fletcher (1985) distinguished two groups of strategies used to avoid pain: avoidant strategies, where attention is diverted from the source of the stress, and attentional strategies, where attention is focused directly onto the stress, pain or anxiety so that it is either reappraised or more information about it is sought. Their meta-analysis of 43 studies showed that avoidant strategies were superior to focusing attention in the short term, i.e., within three days. After 2-6 weeks, a pattern reversal occurred, suggesting that chronic pain, stress and anxiety is better dealt with by paying attention to it, rather than trying to avoid it.

Affleck, Urrows, Tennen and Higgins (1992) conducted research in a sample of rheumatoid arthritis patients. They found that 40% of patients reported using one or more coping strategies each day. The two strategies most often used were taking direct action to reduce the pain and the use of relaxation; those who used relaxation most had less daily pain. Those who used more coping efforts overall were more likely to show declining pain, and lower pain was related to positive mood. Conversely, mood was much less positive for those with more pain.

*Pain, coping and depression.* Associations have been found between coping and depression (Mercado et al., 2000; Brown & Nicassio, 1987). So, like pain and functional limitations, the association between chronic pain and coping cannot really be examined without discussing how depression might affect this relationship. Like many variables associated with pain, causality is difficult to determine (that is, does



the use of a particular coping strategy lead to depression, or does depression cause a person to use a particular coping strategy).

According to Beck (1963; cited in Penedo, Antoni, Schneiderman, Ironson, Malow, Cruess, Hurwitz & LaPerriere, 2001) some individuals may be more prone to depression than others because they hold certain core beliefs about themselves, others and the environment. This may influence their response to stressors, making them not only more likely to develop depression, but also more likely to use maladaptive strategies such as avoidance or denial to cope (Penedo et al., 2001). In other words, a great deal of a depressed person's behaviour may occur in order to decrease contact or avoid the aversive aspects of their life (Cordova & Jacobson, 1997).

Tennen, Affleck, Armeli and Carney (2000) studied the relationship between depression and coping among women with primary fibromyalgia syndrome (PFS), a chronic pain syndrome for which there is no known cause. They found that PFS patients who had a recent depressive episode paid greater attention to their pain than did their never-depressed counterparts. They also engaged in more pain catastrophising. Those with a remote history of depression (MDE 4 years ago) believed that their coping strategies were relatively ineffective in reducing their pain and in enhancing mood. In the same sample, they found greater symptom reactivity among recently and remotely depressed patients than controls, as evidenced by daily changes in mood, functional limitations that were more reactive to increased pain and sleep disturbances.

Weikgenant, Slater, Patterson, Atkinson, Grant and Garfin (1993) examined how depressed and non-depressed chronic low back pain patients coped with stressors compared to healthy controls. They found that depressed back pain patients reported more passive-avoidant strategies than the two other groups while coping responses for the depression-free groups were similar. They concluded that it was the combination of depressed mood and chronic low back pain increased the use of passive-avoidant strategies, not the incidence of back pain alone.

There is some evidence to suggest that the meaning that people give to a stressful situation can impact upon both depression and coping strategies. Vitiliano,

DeWolfe, Maiuro, Russo and Katon (1990; cited in Horn & Munafo, 1997) found that appraisal of the stressful situation as changeable/unchangeable impacted on psychological distress. In their study, patients who used problem-focused coping and saw their situation as alterable had less evidence of depression; this was not true of patients with similar coping style but who saw their situation as unalterable.

Dorland and Hattie (1992) conducted research on coping mechanisms used by female patients with RSI (OOS) as they appraised their injury. This examined how they coped with their injury and how they adapted to having their injury. It was found that emotion-focused coping was used more by those who appraised their RSI as something that must be accepted. Information-seeking was the method of coping used more by those who appraised their RSI as an injury which could be changed. There was a significant relationship between those who used more problem-focused coping and positive affect, and between those who used more emotion-focused coping and negative affect. It was found that those patients who had difficulty asking for help had more negative affect.

This research highlights the important influence on their quality of life of the type of coping used by people with chronic pain. The general trend in the literature suggests that active (or problem-focused) coping is associated with more favourable outcomes and passive (or emotion-focused) coping with less favourable outcomes. However, not much research has been conducted on coping strategies used by people with a chronic health condition versus those who do not have one. Moreover, like functional limitations, the existence and types of coping strategies used by people with chronic pain cannot be considered without also examining depression, because of the association between passive coping and depression.

### **1.5 Chronic pain and Relationships**

The section above clearly demonstrates that there are associations between chronic pain and depression, functional limitations and coping strategies. The links



between chronic pain and relationship satisfaction will now be explored. Research about pain and relationships, and their association with the moderating factors of depression, functional limitations and coping strategies will be covered.

### *1.5.1 Social Support*

Research has demonstrated that the same life experience, such as illness and chronic pain, can have different effects on different people (Davison & Neale, 1998). It has already been mentioned<sup>2</sup> that the nature and severity of physical illness or injury and the degree of pain experienced only account for 25% of the impact of chronic pain (Spence, 1993). An important factor moderating the impact of chronic pain is social support.

There are various types of social support. Structural social support refers to “a person’s basic network of social relationships, for example, marital status and number of friends” (Davison & Neale, 1998, p. 186). Functional social support is “concerned more with the *quality* of a person’s relationships, for example, whether the person believes he or she has friends to call on in time of need” (Davison & Neale, p. 186).

Structural support is a well-established predictor of mortality. Men who have lower levels of structural support are more likely to die after experiencing a heart attack than are those with higher levels of structural support (Schoenbach, Kaplan, Fredman & Kleinaum, 1986; cited in Davison & Neale, 1998). A lack of structural support or functional support also increases the likelihood of developing an illness. Higher levels of functional support have been related to lower rates of atherosclerosis and to the ability of women to adjust to chronic rheumatoid arthritis (Davison & Neale, 1998).

How does social support exert its beneficial effects? One possibility is that higher levels of social support increase the occurrence of positive health behaviours, for example, eating a healthy diet, not smoking, and moderating alcohol intake. In

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<sup>2</sup> See “Psychosocial Factors and Chronic Pain”.

addition, low levels of social support are related to an increase in negative emotions (Davison & Neale, 1998).

Kamarck, Annunziato and Amateau conducted a study examining social support in naturalistic settings (1995; cited in Davison & Neale, 1998). College-aged women were assigned to high- or low-stress conditions and experienced them with or without a close friend. In one part of the study, stress was created by having the experimenter behave coldly and impersonally, telling participants to improve their performance. For each women in the social support condition, a close friend “silently cheered her on” and sat close to her, placing a hand on her wrist. The dependent variable was blood pressure, measured while participants performed the task. As expected, high stress led to higher blood-pressure levels. However, the high-stress condition produced its effects on blood pressure primarily in those women who experienced the stress alone. Social support was thus shown to have an effect on a physiological process.

Given the beneficial effects of social support, one might expect it to be easier for those in intimate relationships to adjust to the development of a chronic pain disorder. Indeed, it has been found that being married decreases the risk for physical and mental illness, and is associated with better immune function (Schmaling & Scher, 1997).

### *1.5.2 Pain and Relationships*

However, it is overly simplistic to consider intimate relationships as simply providing beneficial social support (Turk, 2000). Not all support is positive, even if it is well intended. Not all people need or want the same type of support, and not every healthy partner knows what support is desired, or is capable of providing it. Moreover, needs may change as the chronic pain disorder progresses. What is helpful support for one problem area may not be for another, and what is helpful at one time may not be at a different point in time (Turk, 2000).

As previously noted, a key characteristic of long-term couple relationships is that they adapt to changing life circumstances (Halford et al., 1997). The literature on chronic pain has consistently demonstrated that it can affect all aspects of a person's life, including physical, emotional, social and vocational functioning (Schwartz & Edhe, 2000). Therefore, the introduction of chronic pain will inevitably affect a couples functioning as they adjust to changing circumstances.

It was also mentioned previously that major life stressors and daily stressors take their toll on relationship satisfaction (Christensen & Walczynski, 1997). The present review has outlined two major stressors that can result from chronic pain: depression and functional limitations. There are a multitude of other potential stressors arising from chronic pain, ranging from sleeplessness to uncertain and unpredictable futures (Turk, 2000). Thus, a couple in which one partner has chronic pain may not only have to adjust to a changing lifestyle, but may also have to cope with a high degree of stress.

It is not surprising then that chronic pain can impose a significant toll on intimate relationships. Two literature reviews concluded that patients with chronic pain and their partners have poor relationship adjustment as compared with control groups (Payne & Norfleet, 1986) and higher than average marital dissatisfaction (Turk, Flor & Rudy, 1987).

Flor, Turk & Scholtz (1987) studied 58 male chronic pain patients and their spouses. The couples were assessed on pain intensity and interference with life, mood, and marital satisfaction. This was done using interviews and self-report instruments, including the West Haven-Yale Multidimensional Pain Inventory (WHYMPI; Kerns, Turk & Rudy, 1985), the Beck Depression Inventory (BDI; Beck, Ward, Mendelson, Mock & Erlbaugh, 1961), and the Locke-Wallace Marital Adjustment Scale (MAS; Locke & Wallace, 1959). They found considerable pain-related change in marital satisfaction in both patients and spouses, with the spouses experiencing greater marital dissatisfaction than the patients. In spite of this, the average MAS scores of the patients and spouses were still in the normal range; however the large variance indicated that some marriages were severely disturbed. Interestingly, they found that neither patients' interference and pain levels, nor spouses' perception of patients' pain

and interference directly related to the spouses' mood or marital satisfaction. Flor et al. (1987) hypothesised that the patients' and spouses' emotional and cognitive reactions to the pain problem and the quality of the marital relationship were more important than the pain problem *per se*.

*Partner support and pain behaviour.* Flor, Kerns & Turk (1987) demonstrated an important interaction between relationships and chronic pain when they found that positive reinforcements from a solicitous partner were directly related to increased levels of pain. In addition, pain patients with partners who ignored or responded negatively when pain behaviours occurred were more likely to be active. They concluded that the way in which the person in pain construed the spouse's style of reinforcement was the best predictor of both pain experienced and pain behaviours.

Similarly, Gil, Keefe, Crisson and Dalfen (1987) found that positive social support was associated with increased pain behaviours. Gil et al. (1987) studied 51 patients, 80% of which were married. They completed self-report measures, including the Social Support Questionnaire (SSQ; Sarason, Levine, Basham & Sarason, 1983) and the McGill Pain Questionnaire (MPQ; Melzak, 1975). Behavioural observations of pain behaviours (guarding, bracing, rubbing, grimacing and sighing) were also carried out. In addition to finding that pain behaviour varied as a function of the level of satisfaction with social support, they found that the number of people available for support was not as important as the perceived quality of the support. Thus, they suggested that a 'positive' marital relationship might do more to perpetuate the chronic pain syndrome than ameliorate it.

Romano, Jensen, Turner, Good & Hops (2000) conducted research to determine whether observed partner solicitous and negative responses would be associated with rates of patient pain behaviour. They also examined depression, gender, pain level and relationship satisfaction as moderating factors between partner behaviours and patient pain behaviours. They included 121 patients (who had undiagnosed musculoskeletal pain) and their partners in an intimate relationship. The couples were assessed using videotapes and coding systems for behavioural observations, along with self-report scales including the Sickness Impact Profile – Physical Dimension (SIP; Bergner, Bobbitt, Carter & Gilson, 1981), the WHYMPI,

the Pain Behaviour Checklist (PBCL; Turk, Wack & Kerns, 1985), the MPQ, the Centre for Epidemiological Studies-Depression Scale (CES-D; Radloff, 1977), and the Dyadic Adjustment Scale (DAS; Spanier, 1976).

They found that the rate per minute of partner solicitous behaviour was significantly and positively associated with rates of pain behaviour. Also, partner negative responses to patient pain behaviour were associated negatively with the rate of patient pain behaviour. Depression emerged as a moderating factor between partner behaviours and patient pain behaviours; however relationship satisfaction did not. Romano et al. (2000) suggested that the reason for this might be that the sample reported high overall rates of marital satisfaction. Neither gender nor pain intensity were found to be moderating factors.

Williamson, Robinson & Melamed (1997) attempted to replicate the results of the Flor, Kerns & Turk (1987) study with 52 patients with rheumatoid arthritis and their spouses. They examined whether patient's pain behaviours would be positively related to solicitous and distracting responses and negatively related to punishing responses from the spouse. They used video recordings and visual analogue scales for their behavioural observations, as well as self-report measures, including the WHYMPI, the MAS, a disease severity rating and the number of areas currently affected with pain. They found that attention from the spouse was associated with increased pain behaviour, but that the frequency of pain behaviours did not differ between solicitous, distracting and punishing responses. Moreover, marital adjustment did not alter the frequency of solicitous, punishing or distracting responses from the spouse. However, they pointed out that rheumatoid arthritis has a diagnosable cause of pain, while many of the previous studies were using pain patients with no diagnosis.

Overall, this research highlights the complexity of the associations between chronic pain and interactions involving patients and their partners. This complexity helps to explain some of the apparently counterintuitive findings of the present study<sup>3</sup>.

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<sup>3</sup> Refer to the Discussion section

*Effects of chronic pain on partners.* Some research has suggested that chronic pain may take an even greater toll on the relationship for the partner than the patient. (Schwartz & Ehde, 2000). One reason for this is that substantial additional demands are often placed on partners who have to cope with major life changes (for example entering the workforce for the first time) and financial strains. Well-established roles, responsibilities, and boundaries may have to change, and demands for both emotional and instrumental support may become excessive (Turk, 2000).

Skevington (1995) also posited that the well-being of significant others is likely to be affected by the constant and regular care they provide to those with pain and disability. Through a negative feedback loop this may, in turn, affect the behaviour and well-being of the patients themselves. In other words, the degree to which spouses adjust to their partner's condition is likely to affect not only their own well-being but also that of their partner (Bigatti & Cronan, 2002)

Research has shown that spouses of those who are chronically ill experience considerable distress (Skevington, 1995). Studies of emotional functioning of partners have demonstrated that 20% to 50% experience at least mild depressive symptoms (Schwartz & Edhe, 2000). Emotional reactions in partners have been found to include anger and resentment, insecurity, powerlessness, guilt, anxiety, discouragement, worry, physical and emotional stress, burnout and fatigue, all of which lead to low life satisfaction (Bigatti & Cronan, 2002).

As another example, Feuerstein, Sult and Houle (1985) compared 33 low back pain patients with 35 healthy controls. They were assessed on measures of environmental stress (the Social Readjustment Rating Scale [SRRS; Holmes & Rahe, 1967], the Family Environment Scale [FES; Moss & Moss, 1981] and the Work Environment Scale [WES; Moss, 1981]), psychological distress (the State-Trait Anxiety Inventory [STAI; Spielberger, Gorsuch & Lushene, 1970] and the BDI) and their pain experience (the MPQ). The results demonstrated that spouses of low back pain patients often found their relationship with their partner was markedly affected by the condition. Moreover, the level of interpersonal conflict and distress in the family was increased when compared to healthy controls. The increased family conflict was correlated with increased anxiety and depression, while greater family



organisation and family independence was associated with less anxiety and depression.

### *1.5.3 Relationships, Pain and Depression*

The research reviewed earlier<sup>4</sup> demonstrated a clear association between chronic pain and depression. How then might depression moderate between chronic pain and its impact on relationships? Ferster (1973; cited in Cordova & Jacobson, 1997) believed that the behaviour of a depressed person typically consisted of (1) a rigid repertoire, (2) a repertoire that ineffectively avoids aversive situations and (3) a repertoire that does not include sufficient exploratory behaviours. Behaviours that are limited in breadth, flexibility, or effectiveness are likely to increase a relationship's susceptibility to distress.

The interpersonal theory of depression hypothesised that depressed people may elicit negative reactions from others (Coyne, 1976a; cited in Davison & Neale, 1998). The depression is then maintained by the negative responses of significant others to the depressive's symptomatic behaviour (Coyne, 1976b; cited in Gotlib & Hammen, 1992).

Coyne (1976b) proposed that a sequence of behaviour occurs, causing the depressed individual to create a negative social environment. The sequence begins with the depressed individual exhibiting symptoms of depression, often in response to stress. People in the social environment respond to these symptoms with concern and support. The symptoms gradually increase in frequency and become demands, which elicit feelings of resentment and anger from other people, who try to hide their feelings because the depressed person is obviously distressed. Therefore, the people in the environment send the depressed person mixed messages, containing both veiled hostility and false reassurance and support. The depressed person is not only aware of these discrepant messages, but also feels rejected by those sending them and becomes even more symptomatic to gain support. In turn, it becomes even more aversive for other people to interact with them and can continue to the point where people either withdraw from interactions with the affected person, or have the person withdrawn



through hospitalisation. This is a vicious cycle, called the “deviation-amplifying” process (Gotlib & Hammen, 1992).

This theory has been supported by data showing that the behaviour of depressed people elicits rejection from others (Davison & Neale, 1998). Furthermore, several studies have demonstrated that depression in one person can result in increased negative affect in others with whom they interact, decrease others’ enjoyment of time spent with the depressed person and change the interpersonal dynamics of their relationships (Gotlib & Hammen, 1992). Therefore, it follows that living with a depressed person (such as a chronic pain sufferer) can exert a significant toll on the depressed individual’s spouse and family. This is also supported by data indicating the presence of hostility in the marital interactions of depressed persons (Gotlib & Hammen, 1992).

Pertinently, it has been suggested that the pervasive effects of depression and other aspects of poor health appear to be passed on between chronic pain patients and their spouses (Skevington, 1995). For example, Chun, Turner and Romano (1993) found that not only were pain patients more depressed than matched pain-free controls, but their partners were also significantly more depressed than the partners of those in the control group. Thus, pain patients were more disabled than controls and so too were their partners.

Kerns and Turk (1984) found that spouses and patients agreed very well about the pain severity and pain experience of the patient. Further to this, they found that for those who were maritally dissatisfied, mood and marital dissatisfaction were correlated. In this study, depression scores failed to predict pain, but depression did predict the degree of marital satisfaction. Kerns and Turk (1984) hypothesised that pain and depression may be socially mediated by the behaviour and attitudes of close family members.

It is not unexpected then, that spouses of chronic pain patients are frequently depressed. Fear about their partner’s health, guilt, anger, frustration and resentment

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<sup>4</sup> See “Depression” section

are common and may all contribute to low mood (Skevington, 1995). James and Large (1992) studied the effect of pain on the “closest other”, and found that these people were most conscious of the limitations in their own lives, due to the patient’s pain and distress at being unable to share the same activities and of the communication pattern initiated by those in pain of *not* discussing the illness<sup>5</sup>. Paradoxically, although the closest others thought they understood the pain person well, those in pain did not themselves feel well understood at all, in contrast to the views of Kerns and Turk (1984).

Revenson and Majerovitz (1991) conducted a study of depressed pain patients moderately disabled with severe rheumatoid arthritis, and their partners. They used self-report measures, including the DAS, the CES-D and the Perceived Stress Scale (PSS; Cohen & Williamson, 1988), as well as open-ended questions from the authors. From this research, five themes were identified. These were distress and feelings of helplessness at seeing their partner in pain; frustration with their limitations; negative changes in their mood; a reduction in shared pleasurable activities (ranging from sex and socialising to recreational activities) and feelings of fear and uncertainty about their partner’s future health and implications for their married life. They found that well-adjusted marriages had partners with relatively low and normal levels of depression.

Schwartz and Slater (1991) investigated the variability in partners’ mood. They found that the patient’s pain intensity, spouses’ emotional reaction to it, their anger and their satisfaction with the marital relationship together accounted for 35% of the variation in spousal depression. Even patients with moderate pain were found to have spouses with clinically significant depression in this study.

Overall, this research demonstrates a robust association between chronic pain, intimate relationships and depression, not only in the pain patient but in the partner also. Although some elements of the literature are contradictory (e.g., James & Large, 1992; Kerns & Turk, 1984), it was considered vital to include depression as a factor in

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<sup>5</sup> Refer to the Discussion section, page 91, for more examination of communication patterns of chronic pain patients.

the current study, to assist in explaining the link between pain and relationship satisfaction.

#### *1.5.4 Relationships, Pain and Functional Limitations*

It has been established that chronic pain can cause limitations in almost any area of a person's life<sup>6</sup>. The extent of their limitations may affect relationship satisfaction in several ways, two of which are explored below.

Firstly, functional limitations determine the burden that needs to be picked up by the partner. The partner may be forced to take on increased responsibilities and roles (Schwartz & Ehde, 2000) and the caregiver workload can become physically and emotionally draining (Turk, 2000). Healthy partners may have contradictory feelings: they have their own needs but are obligated to care for the partner and have to balance the dependence and autonomy of the partner with their own needs (Turk, 2000).

Bigatti and Cronan (2002) sampled husbands with a wife who had fibromyalgia. They found that between 66% and 96% had been faced with significant problems and were forced to make lifestyle changes, including taking on new roles and responsibilities and giving up activities. They also suggested that wives who suffered from poor sleep quality had more difficulty with their daily activities, which may have further burdened the husband. Moreover, loss of employment due to disability can have a profound effect on family life, for example by causing financial strain (Skevington, 1995).

Secondly, there are multiple interpersonal and social impairments suffered by chronic pain patients themselves. In particular, the feelings of dependence and loss of sexual desire have a negative impact on both marital adjustment and family satisfaction (Kelley, 1998). Henriksson (1995; cited in Kelley, 1998) studied 40 women with fibromyalgia, who reported that the disruption of family life was one of the biggest losses they experienced. They cited the reasons for this as being the

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<sup>6</sup> See "Functional Limitations" Section

changes in everyday life, the inability to do tasks and the changes in the way they were perceived by family members.

Another major concern faced by pain sufferers is loss of the feeling of being understood (see James & Large, 1992). While their need for social support is greater, they often find it more difficult to obtain (Henriksson, 1995; cited in Kelley, 1998). As mentioned earlier, the needs of a chronic pain patient can differ from situation to situation (Turk, 2000), which makes explaining their needs difficult and impairs communication. This may then have a negative impact on intimacy and trust in a relationship (Thomas & Taylor, 2002). It can also lead to a pattern of not communicating about the disorder, causing frustration in the partner. It must be noted, however, that this may be an encouraging sign as far as pain outcome is concerned (James & Large, 1992). For example, Swanson and Maruta (1980; cited in James & Large, 1992) found that agreement between spouse and patient on the severity of illness was related to poor pain outcome.

While the link between functional limitations and relationship satisfaction does not appear to be a linear one, it is obvious from the research described above that limitations caused by pain may affect couples in multiple ways. Moreover, the fact that activity restriction may mediate between chronic pain and depression must not be forgotten, as this also has important implications for relationship satisfaction.

#### *1.5.5 Relationships, Pain and Coping*

There have been numerous studies of how the individual level of coping by a person with a chronic condition may affect their outcome and wellbeing (eg. Brown & Nicassio, 1987; Suls & Fletcher, 1985; Affleck et al., 1992). However there are few studies of coping with illness at the level of the couple (Danoff-Burg & Revenson, 2000).

There are several models of coping as predictors of partners' adjustment for everyday and major life stressors. Relationship-focused coping involves strategies used to deal directly with problems in the relationship, as opposed to coping with the

changeable stressors of the illness and one's emotional distress (Danoff-Berg & Revenson, 2000).

The partner main effects model suggests that individuals are strongly influenced by their partner's coping. Evidence to support this hypothesis includes the fact that withdrawal (or a demand-withdrawal pattern) predicts marital dissatisfaction and dissolution. In partner interaction models, the type of coping used by one partner in order to adjust to a stressor varies as a function of the other partner's coping style (Berghuis & Stanton, 2002). In other words, the effectiveness of the couples' coping may depend on how well their coping strategies fit together (Danoff-Berg & Revenson, 2000). This may include the use of similar strategies by a couple, or compensatory strategies, where one partner's use of active coping may compensate for the other's low use of that strategy (Berghuis & Stanton, 2002). Revenson (1995; cited in Danoff-Bergman & Revenson, 2000) investigated married couples in which one partner had rheumatic illness and found that coping complementarity was related to better adjustment.

Many types of coping arise from social interaction with others (Skevington, 1995). For example, accepting responsibility and seeking social support can both involve relationships with other people. Other types of coping may be learned and maintained through social learning processes such as imitating others and modelling their behaviour. Social support can also help people in times of stress, because it provides the knowledge that others are able to help with coping (Skevington, 1995).

However, as mentioned earlier, intimate relationships can be both a source of support providing buffering effects against chronic pain and can themselves be a source of stress (Schmaling & Scher, 1997). Relationship problems can lead to more negative interactions between partners and can increase the impact of environmental stressors because the partner's support is not available. Moreover, they can cause partners to be socially isolated because of over-involvement with relationship issues (Turk, 2000). At times, a significant other could impede, rather than support a chronic pain patient's coping attempts (e.g., Romano et al, 2000). Unfortunately, even well-

intentioned partner behaviour may impact negatively on the patient, especially among couples in distressed relationships (Schmaling & Scher, 1997).

There has been little research on the different types of coping strategies used by people in a relationship versus those who are single. The above literature suggests that a troubled intimate relationship may lead to additional stress (over and above the chronic pain problem), which may decrease an individual's ability to cope with pain. In addition to this, the link between chronic pain, relationship distress and depression may be especially important when considering coping abilities, because depression is linked with passive coping (e.g., Tennen et al., 2000; Weikgenant et al., 1993; Dorland & Hattie, 1992).

For example, Mercado et al. (2000) studied 655 people with neck and low back pain, of which 76.4% were married. They used mailed self-report measures, including the Vanderbilt Pain Management Inventory (PMI; Brown & Nicassio, 1987), the Chronic Pain Questionnaire (von Korff, Ormel, Keefe & Dworkin, 1992) and the CES-D. They found that married individuals scored higher on passive coping than non-married (single, divorced, or widowed) and suggested that married individuals have someone else to "take over" when they are in pain. They also found a relationship between depressive symptoms, poor general health and passive coping. Those without depressive symptomatology and those in good general health were more likely to cope with pain by using active strategies.

*Coping and spousal support.* Manne and Zautra (1989) studied 103 women with rheumatoid arthritis and their husbands. They investigated whether positive and negative aspects of spousal interaction correlated with coping and psychological adjustment and looked at the types of coping strategies employed. They used self-report measures for the patient, including illness severity measures, the Activities of Daily Living measure (Fries, Spitz, Kraines & Holman, 1980), the Ways of Coping Scale (Felton & Revenson, 1984), the Inventory of Socially Supportive Behaviours (Barrera, Sandler & Ramsay, 1981) and the Mental Health Inventory (Veit & Ware, 1983). They used similar self-report measures for the spouses of the subjects and also interviewed each spouse.



Manne & Zautra (1989) found that both positive and negative aspects of a patient's relationship with her spouse were important and each had distinct impacts on coping and psychological adjustment. Positive support from the husband was helpful because it gave assistance with cognitive restructuring and information seeking. Spousal criticism, on the other hand, encouraged ineffective and at worst harmful coping strategies such as wishful thinking about a cure and fantasising. Spousal interactions were also indirectly associated with the psychological adjustment of the patient.

Consistent with Schmaling and Scher (1997) and Turk (2000), Manne and Zautra (1989) suggested that a social network might function as either coping assistance or a coping deterrent. Positive social support can be considered coping assistance: significant others may help to encourage effective types of coping by attempting to alter the meaning of the situation so that it is less distressing, by helping the patient through major life changes and by helping to decrease negative emotional responses. However, negative spousal responses may encourage the patient to want to escape the reality of the situation and damage their self-esteem, leading to poor psychological adjustment.

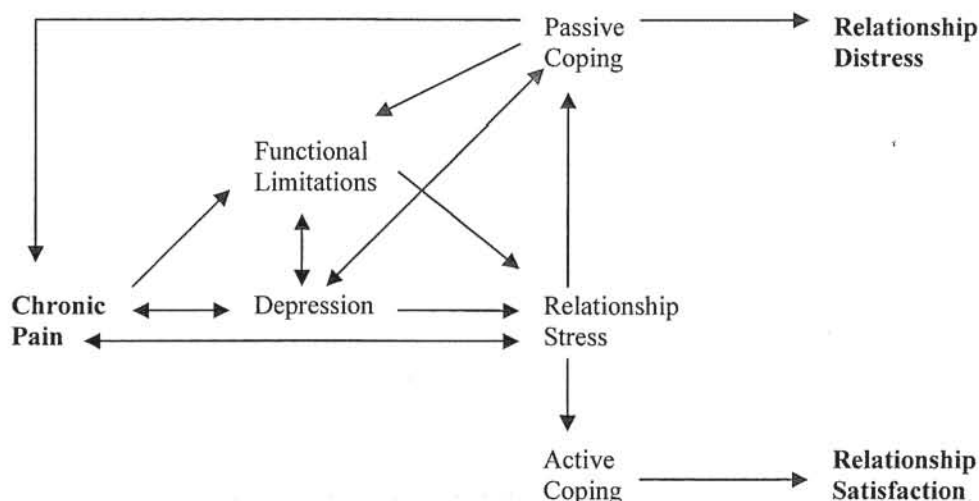
Manne & Zautra (1989) also noted that causality may be in the other direction, that is that the types of coping used may affect the support given, or alternatively the link may be dynamic and reciprocal. This was also suggested by Dunkel-Schetter, Folkman and Lazarus (1987; cited in Manne & Zautra, 1989). They posited that coping style provides interpersonal cues to the support giver regarding what type of help is wanted or needed, and the members of the social network respond to the way the person copes. In spite of the uncertainty in the literature, it is clear that the way a patient copes with chronic pain is interrelated with the state of their intimate relationships and needs to be addressed in the present study.

## **1.6 Summary**

The research outlined above highlights the fact that associations between chronic pain, intimate relationships, depression, functional limitations and coping styles are complex and multi-directional. In order to make the associations



between these variables more evident, the author's conceptualisation of how chronic pain and relationship satisfaction and the moderating variables relate to each other is shown below in Figure 1.



**Figure 1.** Author's conceptualisation of associations between chronic pain and relationship satisfaction/distress and the moderating variables of depression, functional limitations and coping style.<sup>7</sup>

The diagram begins with chronic pain and its associations with depression and functional limitations (Giles & Drummond, 1993; Flor, Turk & Scholtz, 1987; Schwartz & Ehde, 2000; Kelley, 1998; Polatin et al., 1993; Haythornthwaite et al., 1991; Australian Public Service, 1985). It then shows that functional limitations caused by chronic pain can also lead to depression (Revenson & Fleton, 1989; Williamson & Schultz, 1992; 1995; Williamson, 2000a; 2000b). The diagram goes on to show that the combination of chronic pain, depression and functional limitations is likely to cause stress in an intimate relationship (Turk et al., 1987; Flor, Turk & Scholtz, 1987; Manne & Zautra, 1989; Schwartz & Ehde, 2000; Feuerstein et al., 1985; Chun et al., 1993; Kerns & Turk, 1984; James & Large, 1992; Revenson & Majerovitz, 1991; Bigatti & Cronan, 2002; Thomas & Taylor, 2002).

Whether the relationship becomes unsatisfactory is likely to be affected by coping styles. Active coping styles have been found to be associated with more

<sup>7</sup> This diagram is a hypothesis only. In particular, the arrows do not mean that causality has been established. Instead, the arrows are demonstrating the possible associations between chronic pain, depression, functional limitations, coping and relationship functioning.

favourable outcomes (i.e., better adjustment, less pain and functional impairment and less depression: Strahl et al., 2000; Brown & Nicassio, 1987; Suls & Fletcher, 1985; Affleck et al., 1992). Thus, it follows that relationships in which active coping styles are used will be better able to deal with stress, and therefore more satisfactory for both partners.

However, if the chronic pain patient uses a passive coping style, the outcome is likely to be quite different. The diagram shows the association between passive coping, chronic pain, depression and functional limitations (Strahl et al., 2000; Brown & Nicassio, 1987; Suls & Fletcher, 1985; Affleck et al., 1992; Tennen et al., 2000; Weikgenet et al., 1993; Dorland & Hattie, 1992). This association forms a kind of feedback loop, whereupon passive coping may lead to increased pain, which may cause increased depression, and so on. It is likely then, that this will lead to relationship dissatisfaction (Turk et al., 1987; Flor, Turk & Scholtz, 1987; Manne & Zautra, 1989; Schwartz & Ehde, 2000; Feuerstein et al., 1985; Chun et al., 1993; Kerns & Turk, 1984; James & Large, 1992; Revenson & Majerovitz, 1991; Bigatti & Cronan, 2002; Thomas & Taylor, 2002).

### **1.7 The present study**

The present study aims to extend the work of the investigators cited above. A great deal of research has been conducted on chronic pain and relationship satisfaction, and the moderating factors of depression, functional limitations and coping styles. It has been clearly demonstrated that the moderating factors are all linked separately to chronic pain and intimate relationships. However, to the author's knowledge, no research has yet measured all of these variables in one study, and examined the relationships between them.

In particular, the present research aims to extend the work of Flor, Turk and Scholtz (1987; outlined on pages 21-22). To refresh the reader's memory, Flor et al. (1987) examined the effects of chronic pain on marital relationships and the spouses' emotional (and physical) health. They used a number of self-report measures, including the WHYMPI, the BDI and the MAS, as well as interviewing the pain

patient and their spouse. Flor et al. (1987) found that both the patients and their spouses reported a decrease in marital satisfaction related to the pain, and that some of the marriages were severely disturbed. Further, they found that spouses were more maritally dissatisfied than the patients and that a quarter of the spouses were significantly depressed.

However, there are some important differences to the present study. Firstly, as mentioned earlier, Flor et al. (1987) used 58 male chronic pain patients and their spouses. The present study has used 20 female chronic pain patients and their partners. Secondly, the Flor et al. (1987) study compared a sample of 20 diabetic spouses with pain patient's spouses on physical and psychophysiological symptoms. The present study has used 20 female diabetics and their partners, as well as 20 couples with no health concerns. Moreover, the chronic pain (OOS), diabetes and control groups were all assessed on the same measures.

Finally, the couples in the Flor et al. (1987) study were assessed on pain intensity, interference with life, mood and marital satisfaction. Because comparison groups of diabetes patients and a control group with no health concerns were used in the present study, a measure of pain intensity was not included. It was assumed that comparisons with the control group would highlight the effects that were due to health, while comparisons with the diabetes group would highlight the effects that were due to pain (versus a chronic health condition). In addition to measures of relationship satisfaction, mood and interference on life, the present study included a measure of coping styles.

The chronic pain condition OOS was used in the present study because of its continuing prevalence in Australasia. While the rise and decline of OOS in Australia in the early 1980s was echoed in New Zealand, it continues to be a problem in occupations where rapidly repetitive, low-force motions are a large component of the job (Dryson, 2001). Moreover, it appears that many more women than men develop the chronic type of OOS. It has been suggested that because women play a central domestic and family role, they are less able to take time-out while the condition is still reversible (Beadle & White, 1992). Therefore, the present research focuses on women with OOS in heterosexual relationships.

To the author's knowledge, no research has yet examined the effects of OOS on relationship satisfaction. Given the continuing presence of OOS in New Zealand, this research will provide some important information on the psychosocial factors associated with OOS; in particular, relationship satisfaction, mood, extent of limitations and coping styles.

#### *1.7.1 Hypothesis One:*

- a) Relationship satisfaction will be lower in the OOS group compared to the diabetes and control groups.
- b) Based on previous research by Flor, Turk & Scholtz (1987), it was hypothesised that OOS partners would have lower levels of relationship satisfaction than OOS patients.
- c) Depression will be higher in the OOS group compared to the diabetes and control groups.
- d) Functional limitations will be higher for the OOS patients than the diabetes patients.
- e) Active coping styles will be employed more frequently in the control and diabetes groups than the OOS group.
- f) Passive coping styles will be employed more frequently in the OOS group than the diabetes and control group.

#### *1.7.2 Hypothesis Two:*

- a) Depression in the patient or partner will be negatively correlated to relationship satisfaction
- b) Functional limitations in the patient will be negatively correlated to relationship satisfaction
- c) Active coping in the patient or partner will be positively correlated to relationship satisfaction
- d) Passive coping in the patient or partner will be negatively correlated to relationship satisfaction.

### *1.7.3 Hypothesis Three:*

Based on previous research (Kerns & Turk, 1984) and the interpersonal theory of depression (Coyne, 1976b), it was hypothesised that depression would be the strongest predictor of relationship satisfaction in OOS patients and partners. It must be noted, however, that this is partially due to the lack of literature examining functional limitations and coping as predictors of relationship satisfaction.

## 2. Method

### 2.1 Participants

#### 2.1.1 OOS Group

The OOS subjects were recruited from students at the University of Canterbury (Appendix 1), Occupational Overuse NZ Inc (the Canterbury support group), a New Zealand internet support group (weboos2@yahoo.co.nz), advertisements in the Christchurch Star (Appendix 1) and at doctor's clinics in the Canterbury area (Appendix 1). Twenty-one females with OOS and their partners initially participated in the study. One couple was not included in the final analysis because they had not been in a relationship for the required length of time (1 year). The mean age of the OOS patients was 39.6 years (SD=10.30, range 23-60 yrs). The OOS patients had all had their diagnosis for at least six months. The mean age of the OOS partners was 41.1 years (SD=11.13, range 21-57 yrs). The couples had been together for an average of 17.43 years (SD=10.19, range 2-36 yrs). Thirty-seven questionnaires were sent out, of which 21 (57%) were returned.

#### 2.1.2 Diabetes Group

The diabetes subjects were recruited from students at the University of Canterbury, Diabetes NZ (advertisements in their newsletter; Appendix 3, and their website; [www.diabetes.org.nz](http://www.diabetes.org.nz); Appendix 3), advertisements in the Christchurch Star (Appendix 4) and at doctor's clinics in the Canterbury area (Appendix 3). Twenty-two females with diabetes and their partners initially participated in the study. Two couples were not included in the final analysis due to incomplete questionnaires. The mean age of the diabetes patients was 50.7 years (SD=13.96, range 28-68 yrs). The diabetes patients had all had their diagnosis of diabetes for at least six months. The mean age of their partners was 54.25 years (SD=13.78, range 31-79 yrs). The couples had been together for an average of 23.85 years (SD=13.98, range 5-45 yrs). Twenty-eight questionnaires were sent, of which 22 (79%) were returned.

### *2.1.3 Control Group*

The control subjects were recruited from students at the University of Canterbury (Appendix 5) and advertisements in the Christchurch Star (Appendix 6). 20 couples participated in the study. The mean age of the females was 36.65 years (SD=14.65, range 19-62 yrs). The mean age of their partners was 37.8 years (SD=15.53, range 20-65 yrs). The couples had been together for an average of 13.78 years (SD=13.51, range 1.5-40 yrs). Twenty-one questionnaires were sent out, of which 20 (95%) were returned.

An inducement was offered to all participants in the form of inclusion in a draw to win a \$100 gift basket upon completion and return of the questionnaires.

## **2.2 Materials**

The materials used in the study consisted of four self-report questionnaires, which covered the following areas: (a) marital satisfaction; (b) individual impact of having a chronic condition; (c) mood; and (d) coping styles. The questionnaires were all sent in the same order, to standardise any effects that completing each questionnaire might have on answers given for the remaining questionnaires.

### *2.2.1 Dyadic Adjustment Scale*

The Dyadic Adjustment Scale (DAS) was used to assess marital satisfaction. This instrument was designed to assess the quality of relationships as perceived by married or cohabitating couples. The instrument measures four aspects of relationships: dyadic satisfaction (DS), dyadic cohesion (DCoh), dyadic consensus (Dcon) and affectional expression (AE). Most of the items attempt to assess the respondent's perception of the relationship as a functioning group. Partner differences in responding reflect differing perceptions of the relationship's function. (Spanier, 1976).



There are 32 items, most of which are Likert-type scales. For items 1 to 15, participants were asked to respond with 0 (Always disagree), 1 (Almost always disagree), 2 (Frequently disagree), 3 (Occasionally disagree), 4 (Almost always agree), or 5 (Always agree). This section included statements such as "Handling family finances" and "Matters of recreation". Items 16 to 22 ranged from 0 (All the time), 1 (Most of the time), 2 (More often than not), 3 (Occasionally), 4 (Rarely), or 5 (Never). This section included questions such as "How often do you discuss or have you considered divorce, separation, or terminating your relationship?" and "Do you confide in your mate?". Item 23 is "Do you kiss your mate?", ranging from 0 (Never) to 4 (Every day). Item 25 is "Do you and your mate engage in outside interests together?", ranging from 0 (None of them) to 4 (All of them).

Items 25 to 28 range from 0 (Never), 1 (Less than once a month), 2 (Once or twice a month), 3 (Once or twice a week), 4 (Once a day), or 5 (More often). These items included statements such as "Laugh together" and "Calmly discuss something". Items 29 and 30 were yes/no statements including "Being too tired for sex" and "Not showing love". Participants were then asked to rate the degree of happiness in their relationship, ranging from 0 (Extremely Unhappy) to 6 (Perfect). Finally, they were asked about how they feel about the future of their relationship, ranging from 0 (My relationship can never succeed, and there is no more that I can do to keep the relationship going) to 5 (I want desperately for my relationship to succeed, and would go to almost any length to see that it does).

The DAS has been found to have excellent internal consistency ( $\alpha=0.96$ ). The subscales have variable internal consistency, but all are acceptably high (DS .94; DCoh .86; DCon .90; and AE .73; Spanier, 1976; cited in Spanier, 2001). Test-retest reliability was excellent, with a correlation of .96 (Stein, Girodo & Dotzenroth, 1982; cited in Spanier, 2001). The scale was administered to 218 married people and 94 divorced people, and significant differences were found between the two for each item, establishing criterion-related validity. Finally, the DAS has been found to correlate with other measures of interpersonal functioning, indicating good concurrent validity.

In this thesis, the DAS was used as a general measure of satisfaction in an intimate relationship by comparing total scores. It was used because it is applicable to both married and unmarried couples. In general, scores of over 100 indicate relationship satisfaction, while scores of less than 100 indicate relationship dissatisfaction (Spanier, 2001). Higher scores reflected a better relationship, and scores could theoretically range from 0 to 151.

### *2.2.2 Functional Limitations Profile*

The Functional Limitations Profile (FLP; De Bruin, De Witte, Stevens & Diederiks, 1992) is used to assess changes in function due to ill health. The scale consists of 136 items arranged in 12 categories of activity. Each item describes a restriction in activity, and the respondents are required to indicate whether the item applies to them 'today' and whether the restriction is due to their health (Johnson, Wright & Weinman, 1995). The only items which contribute to the scores are those with which the participant agrees and considers due to her health. For each item endorsed, the score assigned is the weighted value (supplied with the manual for the Profile). These item values were derived from cluster analyses of the item and reflect the extent to which the item represents that cluster (Johnson et al., 1995).

The FLP consists of 12 categories, including Ambulation, Body Care and Movement, Mobility, Household Management, Recreation and Pastime, Social Interaction, Emotion, Alertness, Sleep and Rest, Eating, Communication and Work. Of these categories, Ambulation, Body Care and Movement and Mobility were not included, as it was felt that these were not highly applicable to OOS and diabetes. The Eating category was also excluded, as it was felt that the possible dietary restrictions of people with diabetes would affect these scores. This is consistent with previous research, which has only included certain categories of the FLP (eg. Romano et al., 2000).

With regard to psychometric properties, a population of 839 adults aged 25 to 64 were tested and the correlations between each category score and the overall score were computed (Charlton, Patrick & Peach, 1983; cited in Johnson et al., 1995). The internal consistency was generally good, with the Work, Eating, Communication and

Emotion categories being least associated with the overall score. Test-retest reliability was measured over 48 hours, and the overall FLP score showed an average change of 5.3 per cent. Validity was demonstrated by the consistently higher scores over all categories, summary scores and overall score of registered disabled adults and of those reporting poorer health compared with the remaining respondents (De Bruin et al., 1992).

The scores in each category can range from zero to 100. Higher scores indicated more limitation of function. Because no norms have been established, comparisons were made in the present study between OOS and diabetes patients using categories and overall scores. The FLP was considered to be relevant to the present study because of the many different categories of limitation that can be assessed, in particular the psychosocial aspects.

### *2.2.3 Beck Depression Inventory-II*

The Beck Depression Inventory-II (BDI-II) is a self-report instrument for measuring the severity of depression in adults and adolescents. It measures key symptoms associated with clinical depression. Each item consists of four statements describing varying degrees of severity of a depressive symptom; the respondent chooses the statement that most accurately reflects the self over the past two weeks (Beck, Steer & Brown, 1996).

The original BDI (Beck et al., 1961; cited in Beck et al., 1996) was based on the typical descriptive statements regarding symptoms that had been reported frequently by psychiatric patients with depression and only infrequently by non-depressed psychiatric patients. In order to address discrepancies between items in the BDI and DSM-IV criteria, Beck et al. (1996) developed the BDI-II. For this version four items (weight loss, body image change, somatic preoccupation and work difficulty) were dropped and replaced by four new items (agitation, worthlessness, concentration difficulty and loss of energy). The remaining items include sadness, pessimism, past failure, loss of pleasure, guilty feelings, punishment feelings, self-dislike, self-criticalness, suicidal thoughts or wishes, crying, loss of interest,

indecisiveness, changes in sleeping pattern, irritability, changes in appetite, tiredness or fatigue and loss of interest in sex.

Higher scores indicated higher levels of depression. The summed item scores could range from 0 to 63. They were also be categorised in terms of severity of depression: 0-13 was minimal, 14-19 was mild, 20-28 was moderate and 29-63 was severe.

The psychometric properties of the BDI-II were assessed using samples from four different psychiatric outpatient clinics and one college-student group. The internal consistency was excellent ( $\alpha = .92$  for outpatients and  $.93$  for college students). The test-retest reliability was also excellent, with a correlation of  $.93$ . The BDI-II has been positively correlated with other measures of depression, indicating good validity.

The BDI-II measures some somatic factors (e.g., loss of energy) which may also be associated with chronic illness or pain, thereby artificially increasing the BDI-II score. However, research by Brown, Schulberg and Madonia (1995) comparing the BDI and the Hamilton Rating Scale for Depression in primary care patients found that the BDI assessed the amount of subjective distress and functional impairment, as well as affective and somatic distress. Moreover, Cavanaugh, Clark and Gibson (1983; cited in Brown et al., 1995) found that medically ill patients did not report significantly more somatic symptoms than depressed psychiatric patients. Therefore, given its excellent psychometric properties, the BDI-II seemed an appropriate instrument to use in the present study.

#### *2.2.4 COPE*

The COPE is a multidimensional coping inventory developed by Carver, Scheier and Weintraub (1989). It incorporates 13 conceptually distinct scales which were chosen on the basis of previous work demonstrating their role in facilitating or impeding adaptive coping in different contexts, or were developed on theoretical

grounds. In this study, the COPE was used to assess dispositional coping (typical responses to stressors).

The COPE is made up of the following scales: 1. Active coping: taking action and exerting efforts to remove or circumvent the stressor. 2. Planning: thinking about how to confront the stressor, planning one's active coping methods. 3. Seeking instrumental social support: seeking assistance, information or advice about what to do. 4. Seeking emotional social support: getting sympathy or emotional support from someone. 5. Suppression of competing activities: suppressing one's attention to other activities in which one might engage in order to concentrate more completely on dealing with the stressor. 6. Turning to religion: increased engagement in religious activities. 7. Positive reinterpretation and growth: making the best of the situation by growing from it, or viewing it in a more favourable light. 8. Restraint coping: coping passively by holding back one's coping attempts until they can be used. 9. Acceptance: accepting the fact that the stressful event has occurred and is real. 10. Focus on and venting of emotions: an increased awareness of one's emotional distress, and a concomitant tendency to discharge those feelings. 11. Denial: an attempt to reject the reality of the stressful event. 12. Mental disengagement: psychological disengagement from the goal with which the stressor is interfering, through day-dreaming, sleep or self-distraction. 13. Behavioural disengagement: giving up, or withdrawing from the attempt to attain the goal with which the stressor is interfering. Two additional scales (Alcohol/Drug Use and Humor) have since been developed and added to the other scales, but are still regarded as more exploratory (Johnson et al., 1995).

Johnson et al. (1995) suggested that scales 1, 2, 3, 7, and 9 measure coping responses that are adaptive in situations where active coping is required. In the present study, this group of scales has been labeled "Active1". They also suggested that scales 4, 5 and 8 are adaptive, in spite of being less obviously linked with active coping, and this group of scales has been labeled as "Active2". Scales 10, 11 and 13 describe responses that are expected to be maladaptive in situations where active coping is called for, and these have been labeled as "Passive" in the present study.

Concerning its psychometric properties, the internal consistency of the COPE scales is acceptably high, except for the mental disengagement scale (Cronbach's alphas exceeding 0.6; Carver et al., 1989). Test-retest reliability was found to range from 0.42 to 0.89 for different scales, and thus is reasonably stable. Carver et al. (1989) administered the COPE along with several measures of personality dimensions expected to reflect a tendency either for or against active, task-focused coping. The hypothesized "active" scales correlated positively with measures of dispositional optimism and self-esteem and negatively with trait anxiety, while the "passive" scales displayed the opposite pattern, thus demonstrating adequate validity.

The scores for each item range from 1 ("don't do this at all") to 4 ("do this a lot"). Each scale has four items, so scores could theoretically range from 4 to 16, with higher scores indicating that the person endorsed a coping strategy more often. The Active1 subscale score could range from 0 to 80, and the Active2 and Passive subscale scores could range from 0 to 48.

## 2.3 Procedure

Following approval by the University of Canterbury Human Ethics Committee, participants were recruited by placing posters containing information about the study around the University of Canterbury campus and in doctor's clinics in Christchurch. Agencies were contacted to request their permission to place advertisements in their newsletters and websites. Advertisements were also placed in a local newspaper. The Christchurch OOS support group was given a brief talk about the study, and their participation was obtained.

Individuals who were interested in the study contacted the researcher by phone or email (except for the support group where questionnaires were given directly to the participants). People were asked to provide a name and address that the questionnaires could be sent to. The questionnaires were then made into a booklet with an information sheet containing consent information (Appendix 7), some voluntary questions about demographic data (Appendix 8) and the questionnaires in the following order: (1) BDI, (2) DAS, (3) FLP (for OOS and diabetes patients only), and

(4) COPE. They were sent to the participants along with a stamped self-addressed return envelope.



### 3. Results

#### 3.1 Demographic data

Table 1 shows the mean age of patients and partners in each group. For each group, partners were, on average, older than the patients, but not significantly so. When the averages across partners and patients were examined, the OOS and control group were similar in age (40.4 vs 37.2 years) and younger than the diabetes group (52.5 years). The main effect of age was significant [ $F(2,114) = 14.54, p < 0.01$ ], with the diabetes group being significantly older than the other groups (post-hoc Scheffe,  $p < .01$ ).

Table 1 also shows the means, standard deviations and ranges for the length of time the couples had been in relationships. On average, the diabetes group had been together longer than the OOS group (23.9 vs 17.4 years), while the control group had been together less time (13.8 years; [ $F(2,117) = 14.81, p < 0.01$ ]). A post-hoc Scheffe test confirmed that the control group had been together a significantly less time ( $p < .01$ ) than the other groups.

The ethnicity of the participants is also shown in Table 1 for OOS, diabetes and control partners and patients. A large majority of the sample identified themselves as New Zealand Pakeha/European. Only a small percentage identified themselves as being of different ethnicity, including NZMaori, NZChinese, British, Scottish and Canadian.

Table 2 shows the frequencies of the highest level of education achieved by the OOS, diabetes and control patients and partners. The differences between the groups were examined by chi-square analysis. Because of the low frequencies in each cell, the cells were collapsed across high school and tertiary education and across patients and partners in each group. A chi-squared analysis was conducted to investigate the relationship between education level (high school/tertiary) and group (OOS/diabetes/control). This revealed a significant effect [ $\chi^2(2) = 13.71, p < .01$ ], indicating a significant relationship between education level and group. Post-hoc

analyses were conducted for each group. These revealed no significant effect for the OOS group but a significant effect for the diabetes group [ $\chi^2(1) = 5.02$ ,  $p < .05$ ], and the control group [ $\chi^2(1) = 8.29$ ,  $p < .01$ ]. For the diabetes group there were more participants than expected with a high school education and fewer than expected with tertiary education. For the control group the inverse was true, there were more participants with a tertiary than a high school education.

Table 1. *Participants' Age, Length of Time in Relationship and Ethnicity as a Function of Participant Type and Group.*

Demographic		OOS	DIABETES	CONTROL
<i>Age</i>	<b>Patients</b>	39.6 years (10.30) [23 – 60] <i>N</i> = 20	50.7 years (13.96) [28 – 68] <i>N</i> = 20	36.65 years (14.65) [19 – 62] <i>N</i> = 20
	<b>Partners</b>	41.1 years (11.13) [21 – 57] <i>N</i> = 20	54.25 years (13.78) [31 – 79] <i>N</i> = 20	37.8 years (15.53) [20 – 65] <i>N</i> = 20
<i>Length of time in relationship</i>	<b>Patients &amp; partners</b>	17.43 years sd = 10.19 (2 – 36) <i>N</i> = 40	23.85 years sd = 13.98 (5 – 45) <i>N</i> = 40	13.78 years sd = 13.51 (1.5 – 40) <i>N</i> = 40
<i>Ethnicity</i>	<b>Patients</b>	NZPakeha/European 18 Canadian 1 Did not answer 1	NZPakeha/European 19 British 1	NZPakeha/European 17 NZChinese 2 NZMaori 1
	<b>Partners</b>	NZPakeha/European 19 Scottish 1	NZPakeha/European 18 British 2	NZPakeha/European 17 NZChinese 3

Table 2. *Education level of participants as a Function of Participant Type and Group.*

	PATIENT			PARTNER		
	OOS	Diabetes	Control	OOS	Diabetes	Control
High School (no qualification)	3	6	0	0	3	0
High School (qualification)	7	7	3	9	8	5
Tertiary (no qualification)	0	0	1	3	1	2
Tertiary (qualification)	10	7	16	8	8	13

## 2.2 Descriptive Analyses

Table 3 shows the means, standard deviations, minimum and maximum scores on measures of depression, dyadic satisfaction, coping styles and functional limitations for OOS, diabetes and control patients, and OOS, diabetes and control partners.

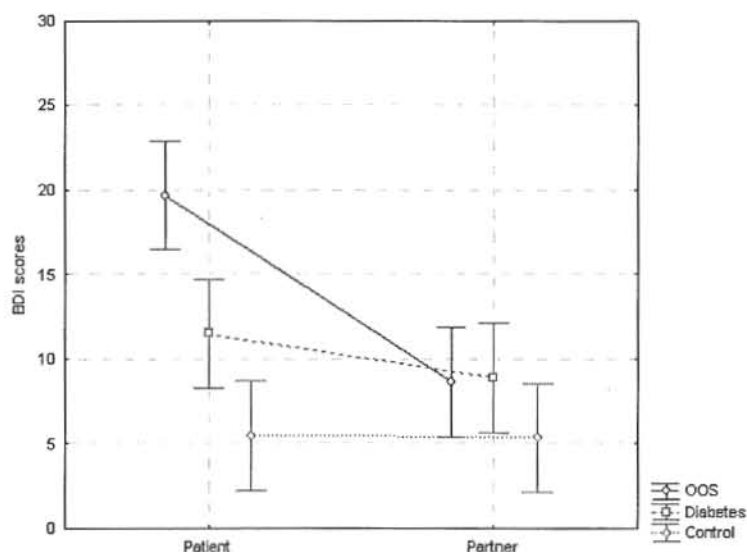
The Beck Depression Inventory-II (BDI-II) is a measure of severity of depression, especially focusing on the last two weeks. The scores can range from 0 to 63, and higher scores indicate higher levels of depression. They can also be categorised in terms of severity of depression: 0-13 is minimal, 14-19 is mild, 20-28 is moderate and 29-63 is severe. The Dyadic Adjustment Scale (DAS) is a measure of satisfaction in an intimate relationship. Scores can range from 0 to 151, and higher scores indicate better relationship satisfaction. The COPE is a multidimensional coping inventory, which measures typical responses to stressors. Out of the original 13 scales, three subscales were developed to assess active and passive coping: Active1, Active2 and Passive. Active1 scores can range from 0 to 80, and higher scores indicate higher levels of active coping. Active2 scores can range from 0 to 48, and again, higher scores indicate higher levels of active coping. Passive scores can range from 0 to 48, and higher scores indicate higher levels of passive coping. Finally, the Functional Limitations Profile was used to assess changes in function due to ill health, including psychosocial factors. The categories included in this study were Recreation and Pastime (Rec), Social Interaction (Soc), Emotion (Emo), Alertness (Alert), Sleep and Rest (Sleep), Communication (Comm), Work. These categories were combined to get an overall score (Total). Higher scores indicate more limitation of function (ie. more impairment).

Table 3: Means, Standard Deviations () and Range of Scores on the Beck Depression Inventory-II (BDI-II), the Dyadic Adjustment Scale (DAS), the COPE, and the Functional Limitations Profile (FLP) as a Function of Participant Type and Group.

		PATIENT			PARTNER		
		OOS	Diabetes	Control	OOS	Diabetes	Control
<b>BDI</b>		19.7 (9.3) [5 – 36]	11.5 (8.8) [0 – 29]	5.5 (4.4) [0 – 14]	8.7 (9.2) [0 – 28]	8.9 (6.1) [0 – 20]	5.4 (3.8) [0 – 13]
<b>DAS</b>		101.5 (20.1) [57 – 139]	102.4 (17.5) [44 – 129]	118.9 (12.3) [93 – 140]	102.3 (15.5) [77 – 126]	99.2 (22.0) [45 – 131]	117.7 (14.5) [88 – 141]
<b>COPE</b>	<b>Active1</b>	50.0 (11.1) [34 – 72]	52.2 (12.3) [26 – 68]	59.9 (10.4) [39 – 78]	54.3 (7.9) [42 – 68]	48.2 (13.4) [25 – 62]	58.2 (9.7) [35 – 73]
	<b>Active2</b>	29.8 (7.2) [20 – 47]	27.9 (8.6) [12 – 41]	31.4 (5.7) [18 – 41]	28.6 (5.0) [18 – 35]	24.3 (5.5) [13 – 31]	29.0 (4.2) [21 – 36]
	<b>Passive</b>	26.4 (6.5) [14 – 39]	24.8 (7.2) [15 – 38]	20.4 (4.6) [12 – 30]	18.8 (3.9) [14 – 28]	21.8 (5.8) [14 – 32]	18.9 (5.1) [14 – 37]
<b>FLP</b>	<b>Rec</b>	29.2 (14.1) [7.1 – 56.1]	16.9 (16.5) [0 – 48.3]	—	—	—	—
	<b>Soc</b>	21.7 (12.4) [3.4 – 43.8]	11.6 (9.2) [0 – 34.1]	—	—	—	—
	<b>Emo</b>	28.2 (21.4) [0 – 77.8]	14.7 (14.9) [0 – 38.1]	—	—	—	—
	<b>Alert</b>	32.9 (24.1) [6.3 – 89.5]	15.8 (18.6) [0 – 60.2]	—	—	—	—
	<b>Sleep</b>	28.4 (20.7) [0 – 70.2]	14.1 (10.8) [0 – 40.3]	—	—	—	—
	<b>Comm</b>	11.4 (8.4) [0 – 26.4]	4.0 (6.8) [0 – 19.6]	—	—	—	—
	<b>Work</b>	36.4 (29.9) [0 – 100]	22.1 (35.6) [0 – 100]	—	—	—	—
	<b>Total</b>	183.1 (98.6) [49.9 – 368.4]	83.0 (62.2) [0 – 185.9]	—	—	—	—

### 2.2.1 The Beck Depression Inventory-II

The BDI-II results were analysed using a 2 (participant: patients/partner) by 3 (group: OOS/Diabetes/Control) ANOVA with repeated measures on the first factor. Repeated-measures ANOVAs were used to take into account the dyadic nature of the couples, ie. that they may have influenced each other's scores<sup>8</sup>. Because significant differences were found on the demographic factors of age and length of time in relationship, a repeated-measures analysis of covariance (ANCOVA) was also performed using age and time in relationship as continuous variables. Finally, a One-Way (group: OOS/Diabetes) ANCOVA was performed on the BDI-II scores, using the patients' FLP subscales as continuous variables. This was done in order to assess the effect of limitations in function on depression.



**Figure 2.** BDI-II mean scores and 0.95 confidence intervals for OOS, diabetes and control patients and partners

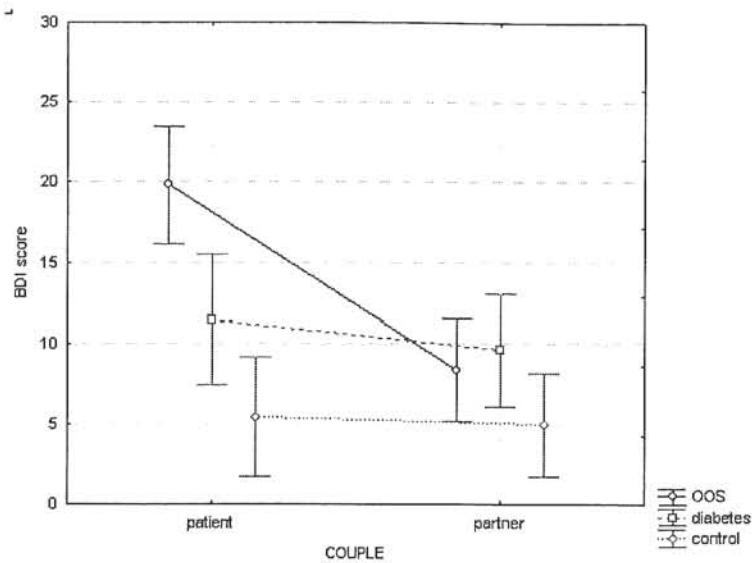
Figure 2 and Table 2 show the mean BDI-II scores for each group of participants and their respective partners. For the control patients and their partners, average BDI-II scores were essentially the same, and were in the normal range. No individual in either group reported a BDI-II score outside of the mild severity range. For patients in the OOS and diabetes groups, mean BDI-II scores were elevated

<sup>8</sup> The results for the BDI, DAS, and COPE were also analysed using a 2 (participants:patients/partner) x 3 (group:OOS/diabetes/control) between-subjects ANOVA. The results were very similar. They can be seen in Appendix 9.

relative to the respective partner group and to the control group. Mean scores for OOS and diabetes partners were very similar, and were in the minimal severity range. For the diabetes patients, the mean score was at the top end of the minimal severity range (cutoff=13). For the OOS patients, the mean score was at the threshold of moderate depression. More specifically, 30% scored in the minimal range, 10% were in the mild range, 50% were in the moderate range, and 10% were severely depressed.

A 2 (participants: patient/partner) x 3 (group: OOS/diabetes/control) ANOVA with repeated measures on the first factor showed that the elevation of BDI scores in patients relative to partners was significant [ $F(1,57) = 20.11, p < .01$ ] as was the elevation of scores across groups [ $F(2,57) = 10.22, p < .01$ ]. A post-hoc Scheffe test ( $p < .01$ ) confirmed that the control group means were significantly lower than the OOS group means. The increasing severity of depression in the OOS patients relative to their partners and to the other groups generated a significant interaction [ $F(2,57) = 10.36, p < 0.01$ ]. Post-hoc Scheffe tests (with criterion set at  $p < .05$ ) confirmed that the OOS patient group was significantly different from both their partners and the control group, but not diabetes patients.

A repeated-measures ANCOVA was then performed on the BDI-II scores, using age of the patient and partner and length of time in relationship as continuous covariates. There was no significant effect of any of the covariates. While there was still a main effect of group [ $F(2,52) = 7.27, p < 0.01$ ] there was no main effect for participant. There was, however, still an interaction effect [ $F(2,52) = 10.67, p < 0.01$ ] which can be seen in Figure 3. Post-hoc tests (Scheffe,  $p < 0.05$ ) revealed the same findings as the repeated-measures ANOVA without covariates. Therefore, it can be seen that the differences in age and length of time in relationship are unable to explain the observed effects of participant type and group on the BDI scores.



**Figure 3.** BDI mean scores and 0.95 confidence intervals for OOS, diabetes and control patients and partners after covarying for age and length of time in relationship

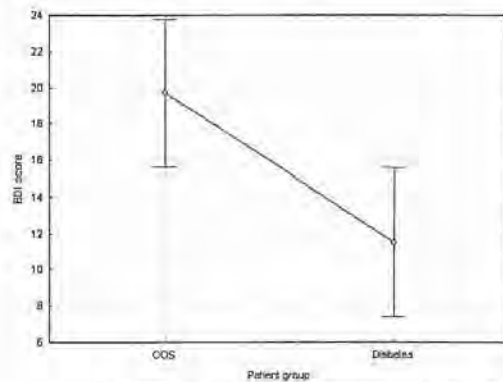
A One-Way ANOVA (group: OOS/diabetes) was performed on the patient's BDI-II scores and revealed a significant difference between the OOS and diabetes patients [ $F(1,38) = 8.22, p < .01$ ]. The same analysis was performed on the FLPTotal subscale, and the OOS and diabetes patients were again significantly different [ $F(1,38) = 14.76, p < .01$ ]. Therefore, a One-Way ANCOVA was performed on the BDI-II scores, using the FLP Total subscale as a continuous covariate. Figure 4 shows the means on the BDI before covarying the FLP subscales and Figure 5 shows the means afterwards. It can be seen from Figures 4 and 5 that there was a large change in the BDI scores when the effects of the FLP subscales were extracted. The mean score of the OOS patients decreased from 19.7 to 16.2, while the mean score of the diabetes patients increased from 11.5 to 15.0. The effect of the covariate FLPTotal was significant [ $F(1,37) = 17.55, p < .01$ ], and caused the significant difference between the OOS and diabetes patients to disappear. This suggests that the severity of depression is similar in the OOS and diabetes, and is in the mild range, once limitations of function were taken into account.

### 3.2.2 The Dyadic Adjustment Scale

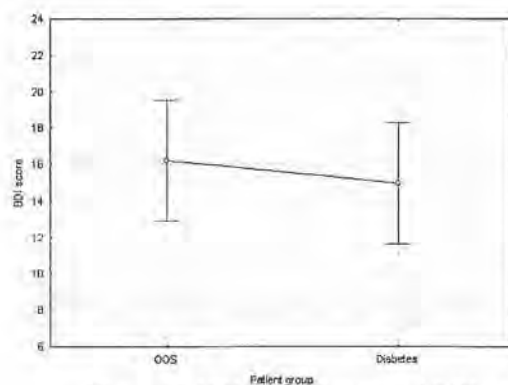
The Dyadic Adjustment Scale was analysed in the same way as the BDI-II scores. A 2 (participants: patients/partner) x 3 (group: OOS/diabetes/control) ANOVA with repeated measures on the first factor was used. A repeated-measures ANCOVA



was also performed, using age, length of time in relationship and the BDI-II score as continuous covariates.

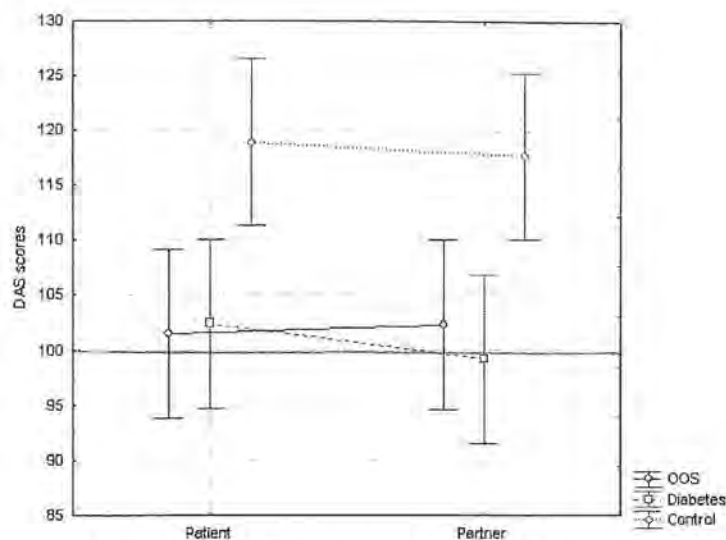


**Figure 4.** BDI mean scores and 0.95 confidence intervals for OOS and diabetes patients.



**Figure 5.** BDI mean scores and 0.95 confidence intervals for OOS and diabetes patients after covarying the FLP subscales.

Figure 6 and Table 2 show the mean DAS scores for each group of participants and their respective partners. On average, scores over 100 are taken as indications of marital satisfaction and scores lower than 100 as dissatisfaction. All of the groups gained mean scores of 100 or more, except for the diabetes partners who were just below the threshold at 99.2. However, there was substantial variability within the groups when they were examined more closely. In the OOS patient group, 45% scored below 100, compared to 30% of diabetes patients and 10% of control patients, indicating marital distress. Similarly, 45% of OOS and diabetes partners compared to 5% of control partners scored below 100, indicating fairly similar levels of marital distress in the partners.



**Figure 6.** DAS mean scores and 0.95 confidence intervals for OOS, diabetes and control patients and partners. Line indicates cut-off score (100) indicating satisfied/dissatisfied relationships.

For each of the groups, comparison of mean patient and partner scores showed that the mean scores were very similar, and there was no significant main effect for participants. Not surprisingly, significant correlations ( $p < .01$ ) were found between patients and partners in each group (OOS:  $r = .69$ ; diabetes:  $r = .57$ ; control:  $r = .80$ ).

Figures 7, 8 and 9 show the distributions of DAS scores for the OOS, diabetes and control groups. It can be seen that there are some differences between the groups. In the OOS group, the partner's scores level off at about 80 on the DAS, while the patient's scores continue to get lower, down to about 55 on the DAS. A different pattern is seen in the diabetes group, where the *patient's* scores level off at about 80 and the partner's scores continue to get lower, down to about 45 on the DAS. In contrast to both of these groups, the majority of the control group's scores are in the satisfied range for *both* partners and patients.

The mean relationship satisfaction of control partners and patients was very high (118.3). The OOS and diabetes group means were over one standard deviation below this, and were very similar (101.9 and 100.8, respectively). This yielded a significant groups main effect,  $F(2,57) = 10.22$ ,  $p < 0.01$ . A post-hoc Scheffe test confirmed that the control group was significantly higher than the OOS and diabetes group ( $p < .01$ ).

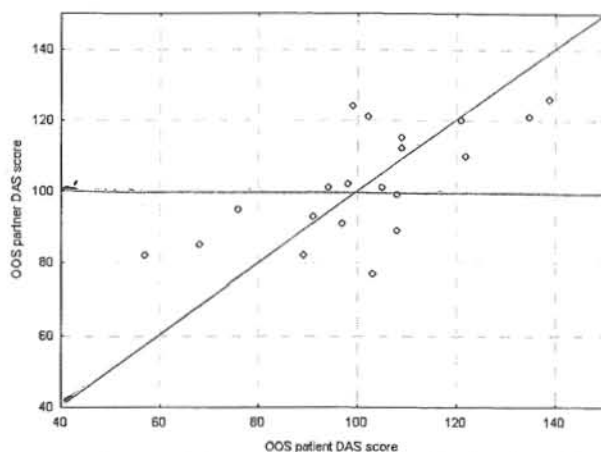


Figure 7. Scatterplot showing distribution of DAS scores for OOS partners and patients.

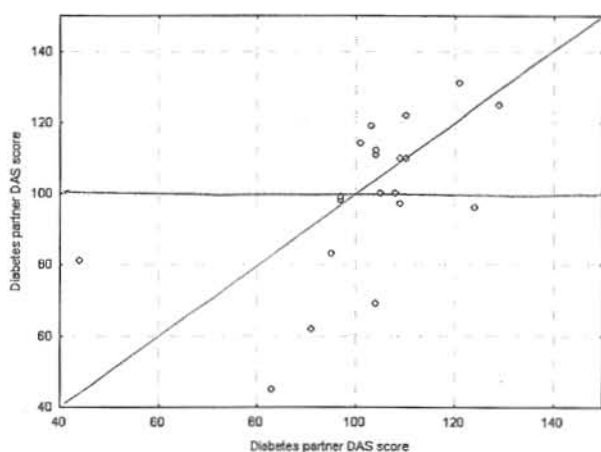


Figure 8. Scatterplot showing distribution of DAS scores for diabetes partners and patients.

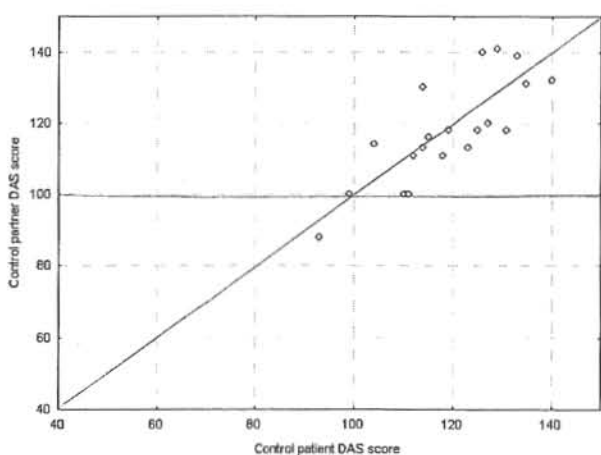
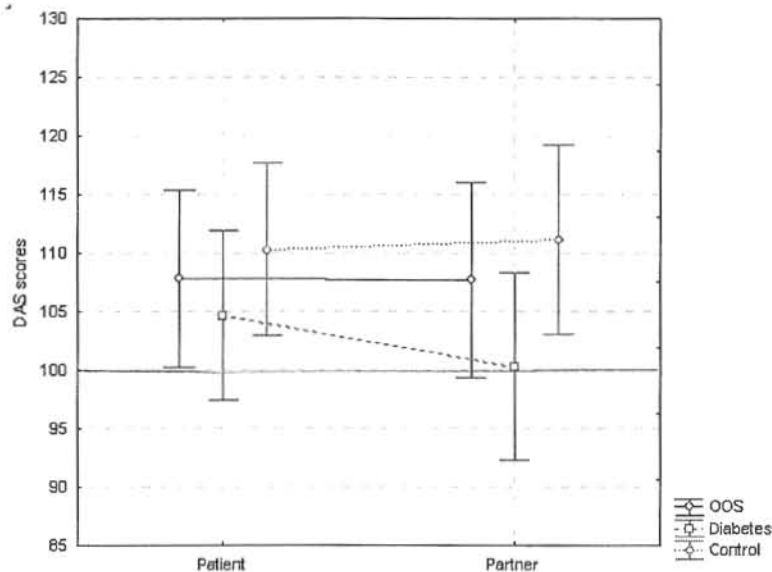


Figure 9. Scatterplot showing distribution of DAS scores for control patients and partners.

A repeated-measures ANCOVA was performed, using age of the patient and partner, the length of time in relationship, and the BDI-II scores of the patients and

partners as continuous covariates. The results can be seen in Figure 10. There was a significant effect of the covariates patient BDI-II [ $F(1,52) = 10.60, p < .01$ ], and partner BDI-II [ $F(1,52) = 7.14, p < .05$ ]. This caused the significant main effect of group to disappear. These results indicate that the differences in marital satisfaction between the groups are lessened when depression is taken into account.



**Figure 10.** DAS mean scores and 0.95 confidence intervals after covarying for age, length of time in relationship and BDI-II scores. Line indicates cut-off score (100) for satisfied/dissatisfied relationships.

### 2.2.3 Functional Limitations Profile

Because only the OOS and diabetes patients were required to complete the FLP, the data was analysed using independent *t*-tests. Each subscale of the FLP was analysed separately.

Table 2 shows the mean scores of the FLP subscales for the OOS and diabetes patients. The mean scores of the OOS group were consistently higher than the diabetes group (Rec = 29.2 vs 16.9; Soc = 21.7 vs 11.6; Emo = 28.2 vs 14.7; Alert = 32.9 vs 15.8; Sleep = 28.4 vs 14.1; Comm = 11.4 vs 4.0; Work = 36.4 vs 22.1; Total = 183.1 vs 83.0).

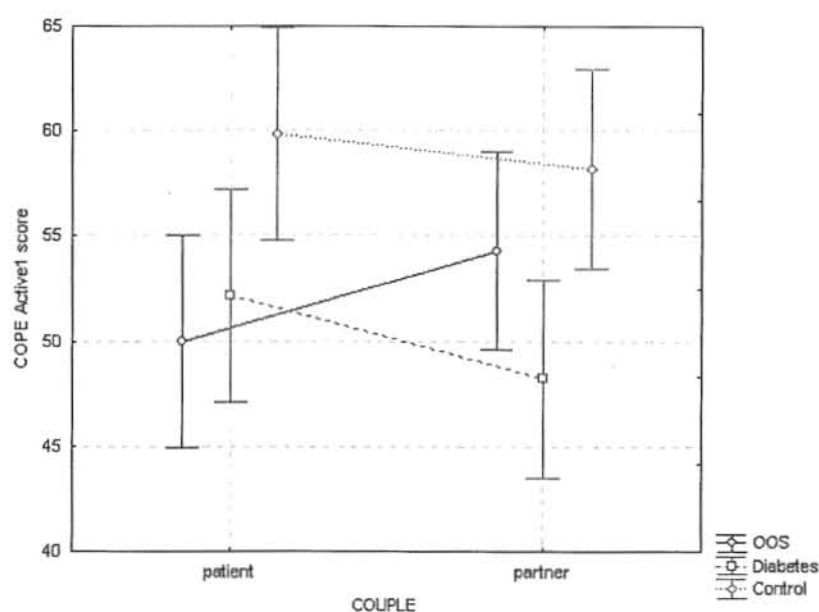
Except for the work subscale, (where the mean differences were substantial, but the mean was very high in both groups), the FLP subscales and total scores were

significantly higher for OOS than for the diabetes group [ $df=38$ ;  $t = 2.25$  (Rec);  $t = 2.92$  (Soc);  $t = 2.33$  (Emo);  $t = 2.50$  (Alert);  $t = 2.74$  (Sleep);  $t = 3.05$  (Comm);  $t = 3.84$  (Total); all  $p < .05$  or better].

#### 2.2.4 The COPE

The subscales of the COPE were analysed in the same way as for the BDI. A 2 (participant: patient/partner) x 3 (group: OOS/Diabetes/Control) ANOVA with repeated measures on the first factor was used for the Active1, Active2 and Passive coping subscales. A repeated-measures ANCOVA was also performed, using age and length of time in relationship as continuous covariates.

#### Active1 Subscale



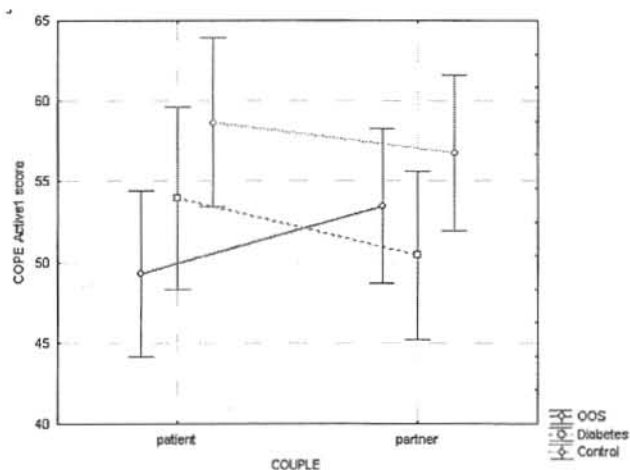
**Figure 11.** COPE Active1 subscale mean scores and 0.95 confidence intervals for OOS, diabetes and control patients and partners.

Figure 11 and Table 2 show the mean Active1 scores of each group of participants and their respective partners. The control and diabetes groups showed a similar pattern, with the patients scoring slightly higher in active coping than the partners. The mean score of the control group, however, was higher than the diabetes group (59.0 vs 50.2). The OOS group showed a different pattern, where on average

patients scored *lower* than their partners. The mean score of the OOS group was similar to the diabetes group, and lower than the control group (52.1).

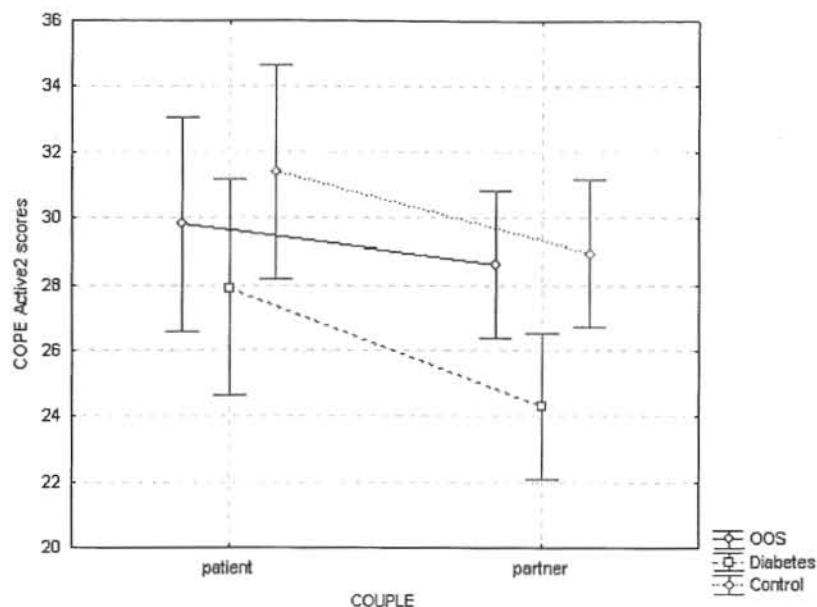
A 2 (participants: patient/partner) x 3 (group: OOS/diabetes/control) ANOVA with repeated measures on the first factor showed that the difference in scores across groups was significant [ $F(2,57) = 5.89, p < .01$ ]. A post-hoc Scheffe test confirmed that the mean of the control group was significantly higher than the means of the OOS and diabetes groups ( $p < .05$ ). There was no significant main effect for participants, and no significant interaction effect.

A repeated-measures ANCOVA, using age of the patient and partner and length of time in relationship as covariates, was then performed. The results can be seen in Figure 12. There was a significant effect of the covariate partner age [ $F(1,54) = 4.57, p < 0.05$ ]. It was also found that age and Active1 coping were significantly negatively correlated ( $r = -.28, p < .01$ ). However, the pattern of results remained the same. In the OOS group, the partners scored higher than the patients, compared to the diabetes group where the patients scored higher than the partners. The significant main effect of group remained present [ $F(2,54) = 3.24, p < 0.05$ ]. There were no other changes. Therefore, the control group scored higher on Active1 coping than the OOS and diabetes group, indicating they used active coping strategies more than the other groups.



**Figure 12.** COPE Active1 subscale mean scores and 0.95 confidence intervals for OOS, diabetes and control partners and patients after covarying for age and length of time in relationship.

### Active2 subscale



**Figure 13.** COPE Active2 subscale mean scores and 0.95 confidence intervals for OOS, diabetes and control patients and partners.

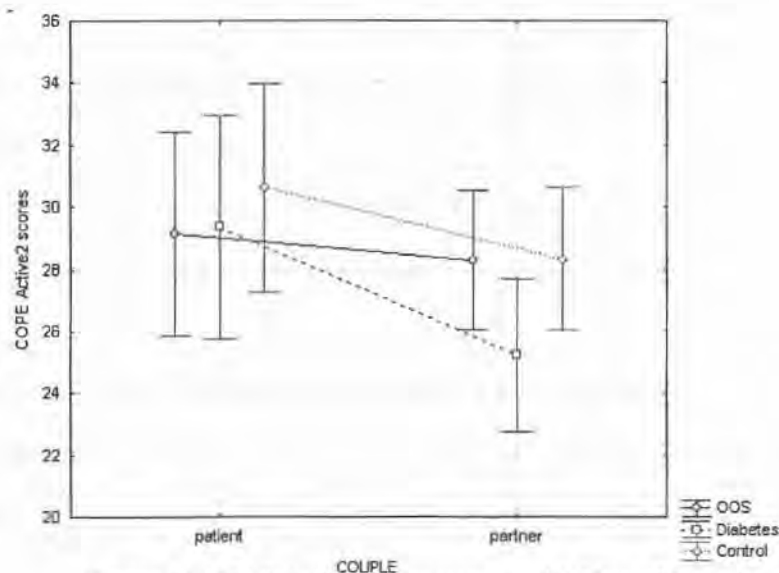
Figure 13 and Table 2 shows the Active2 means for the OOS, diabetes and control patients and partners. It can be seen from Figure 13 that a different pattern of results was found than for Active1. The means of the patients were higher than the partners in *all* three groups (29.7 vs 27.3). Moreover, the scores for all three groups were clustered closer together than Active1, within one standard deviation of each other. However, the groups fell in the same order as Active1, with the control group higher (30.2), and the diabetes group lower (26.10) than the OOS group (29.2).

In spite of the scores being clustered closer together, there was a significant main effect of group [ $F(2,57) = 3.79, p < 0.05$ ], and a post-hoc Scheffe test showed that the control group was significantly higher than the diabetes group ( $p < .05$ ), but not the OOS group. The consistent pattern of patients scoring higher than partners also yielded a significant main effect of participant [ $F(1,57) = 6.00, p < 0.05$ ]. There was no significant interaction effect.

A repeated measures ANCOVA was then performed, using age of patient and partner, and length of time in relationship, as continuous covariates. These results can be seen in Figure 14. Like the Active2 subscale, the covariate partner age was



significant [ $F(1,54) = 4.54, p < 0.05$ ]. This resulted in raising the scores of the diabetes group. So while the pattern of results remained the same, the significant main effects of group and participant disappeared. Not surprisingly, the Active2 subscale and age of participants were significantly correlated ( $r = -.26, p < .01$ ), indicating that as age increased, Active2 coping strategies were used less often. Therefore, although differences were found between the groups and participants on the Active2 coping subscale, these appeared to be due to the age of the partners, and disappeared when this was taken into account.

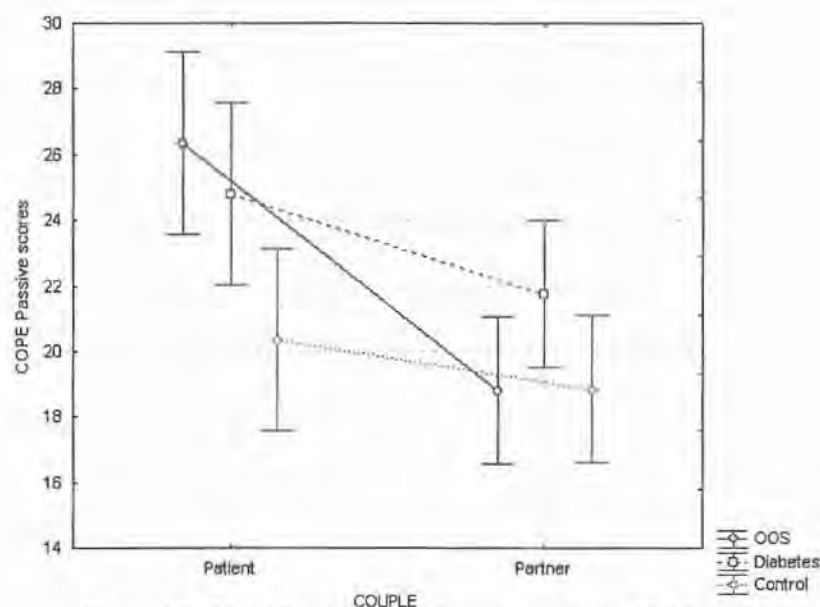


**Figure 14.** COPE Active2 mean scores and 0.95 confidence intervals after covarying for age and length of time in relationship.

### Passive subscale

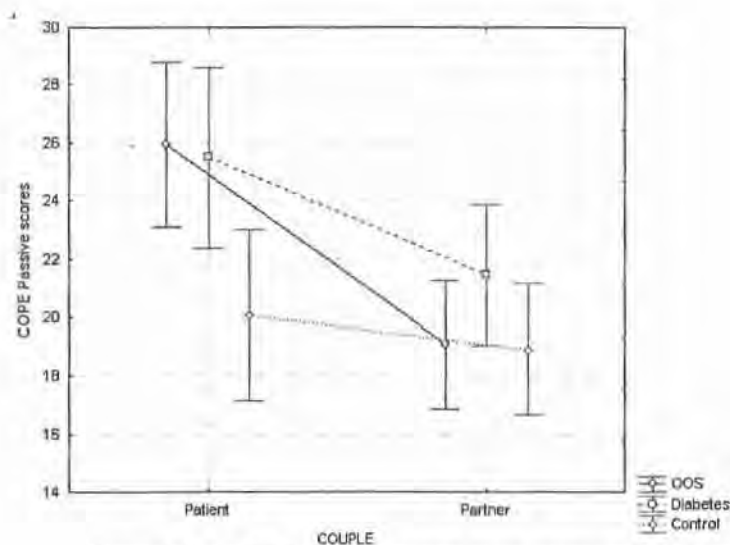
Figure 15 shows the mean Passive coping subscale scores for each group of participants and their respective partners. Similarly to the Active2 subscale, a pattern can be seen in which patients scored higher than partners (23.8 vs 19.8). However, it is notable that the diabetes and OOS groups gained very similar scores (23.3 vs 22.6), which were *higher* than the control group (19.6).

A 2 (participants: patient/partner)  $\times$  3 (group: OOS/diabetes/control) ANOVA with repeated measures on the first factor showed that the elevation of Passive subscale scores in patients relative to partners was significant [ $F(1,57) = 14.53$ ,  $p < 0.01$ ], as was the difference in scores across groups [ $F(2,57) = 5.14$ ,  $p < 0.01$ ]. A post-hoc Scheffe test confirmed that the control group mean was significantly lower than the diabetes group mean (but not the OOS group mean). Therefore, the results indicated that being part of the diabetes patient group was associated with higher levels of passive coping.



**Figure 15.** COPE Passive subscale mean scores and 0.95 confidence intervals for OOS, diabetes and control patients and partners

A repeated-measures ANCOVA was then performed using age of the patient and partner and length of time in the relationship as continuous covariates. While the same pattern emerged, of patients being higher than partners, there was a significant effect of the covariate time in relationship [ $F(1,54) = 4.89$ ,  $p < 0.05$ ]. The results can be seen in Figure 16. There was still a main effect of participant [ $F(1,54) = 7.07$ ,  $p < 0.05$ ] and group [ $F(2,54) = 4.73$ ,  $p < 0.05$ ]. A post-hoc Scheffe test confirmed that the control group was significantly lower than *both* the OOS and diabetes groups. These results indicate that passive coping is highest in the patients with a chronic health condition.



**Figure 16.** COPE Passive subscale mean scores and 0.95 confidence intervals for OOS, diabetes and control patients and partners after covarying for age and length of time in relationship.

## 2.3 Correlations

Pearson Product-moment correlations ( $r$ ) were computed separately for the OOS, diabetes and control patients and partners to determine whether there were any associations between dyadic satisfaction, depression, functional limitations and coping styles. It was predicted for all the groups that higher scores on the DAS, indicating better relationship satisfaction, would be negatively related to depression, functional limitations and passive coping, and positively related to active coping.

### 2.3.1 Patients

*Depression.* Table 4 shows that depression was, as expected, negatively correlated with relationship satisfaction across the patient groups, but only significantly so for OOS patients ( $r = -.72$ ). Depression in the partners was also negatively correlated across the groups, but again only significantly so for the OOS partners ( $r = -.63$ ).

Table 4: *Pearson Product-Moment Correlations Between Measures of Relationship Satisfaction, Depression, Functional Limitations and Coping Styles for Patients*  
*[Significant (non-zero) correlations are shown with \*]*

Dyadic Satisfaction (Dyadic Adjustment Scale)			
OOS patient	Diabetes patient	Control patient	
Beck Depression Inventory-II	-0.72*	-0.38	-0.34
Functional Limitations Profile			
Recreation	0.18	0.09	---
Social	-0.52*	0.10	---
Emotion	-0.25	0.04	---
Alertness	0.04	0.21	---
Sleep	-0.37	-0.11	---
Communication	0.51*	0.26	---
Work	-0.14	-0.05	---
Total	-0.14	0.02	---
COPE			
Active1	0.20	-0.13	0.39
Active2	0.03	0.00	0.53*
Passive	-0.66*	0.07	0.28
Partner BDI-II	-0.63*	-0.19	-0.17
Partner COPE			
Active1	0.05	0.26	-0.23
Active2	0.27	0.27	0.30
Passive	0.47*	-0.27	0.36

\* =  $p < .05$

*Functional limitations.* FLP scores were predicted to be negatively correlated with relationship satisfaction. In the diabetes group, correlations were either small and positive, or small and negative, and were in no case significant. For the OOS group, correlations were in all but one case (alertness) larger than for diabetes patients, and more consistently negative. Only social limitations were significantly negatively correlated with relationship satisfaction ( $r = -.52$ ). Against expectations, communication limitations were positively correlated with satisfaction for both patient groups, albeit only significantly so for the OOS group ( $r = .51$ ).

*Coping.* Active coping was predicted to be positively correlated with relationship satisfaction. As Table 4 shows, all but one of the non-zero correlations were positive, but only that between Active2 score and satisfaction for control patients was significant. Passive coping was predicted to be negatively correlated with satisfaction, and this was so for the OOS patients ( $r = .66$ ). This was not replicated for the diabetes patients (effectively zero correlation), while for the control patients, the correlation was positive ( $r = .28$ , n.s.).

Similarly, active coping in the partner was predicted to be positively correlated with relationship satisfaction in the patient. Again, all but one of the correlations was positive, but not significantly so. Partner passive coping was predicted to be negatively correlated to patient satisfaction. Unexpectedly, the OOS partners were significantly positively correlated ( $r = .47$ ). The diabetes partners were negatively correlated ( $r = -.27$ , n.s.) and the control partners were positively correlated ( $r = .36$ ).

Partner correlations were then computed, using both the partner variables, and the patient variables. Expectations were the same as those for the patients.

### 2.3.2 Partners

*Depression.* Table 5 shows that depression was, as expected, negatively correlated with relationship satisfaction across the partner groups, but only significantly so for OOS partners ( $r = -0.74$ ). Depression across the patient groups was also negatively correlated to partner satisfaction, but again only significantly so for the OOS patients ( $r = -.60$ ).

*Coping.* Active coping was predicted to be positively correlated with relationship satisfaction. As Table 5 shows, both of the active coping scales were significantly positively correlated for OOS partner satisfaction (Active1:  $r = .47$ ; Active2:  $r = .57$ ). This was not replicated for the diabetes and control partners (effectively zero correlations), except for the control partners' Active2 score ( $r = .27$ , n.s.). Unexpectedly, passive coping was also significantly positively correlated with

relationship satisfaction ( $r = .47$ ). This was not so for the diabetes patients, while the correlation for the control partners was small and positive.

Similarly, patient active coping was predicted to be positively correlated to partner relationship satisfaction. This was the case for the OOS patients, but only the Active2 score was significantly positively correlated ( $r = .49$ ). This was not replicated in the diabetes and control patients (effectively zero correlations). Patient passive coping was predicted to be negatively correlated to partner satisfaction. This was the case for OOS and diabetes patients; however not significantly.

Table 5: *Pearson Product-Moment Correlations Between Measures of Relationship Satisfaction, Depression, Functional Limitations and Coping Styles for Partners*  
[Significant (non-zero) correlations are shown with \*]

Dyadic Satisfaction (Dyadic Adjustment Scale)			
OOS Partner	Diabetes partner	Control partner	
Beck Depression Inventory-II	-0.74*	-0.25	-0.31
COPE			
Active1	0.47*	-0.10	-0.07
Active2	0.57*	-0.04	0.27
Passive	0.47*	-0.04	0.15
Patient BDI-II	-0.60*	-0.37	-0.41
Patient FLP			
FLPRec	0.42	-0.10	---
FLPSoc	-0.23	-0.05	---
FLPEmo	0.20	-0.14	---
FLPAlert	-0.13	0.15	---
FLPSleep	-0.17	-0.00	---
FLPComm	0.06	0.08	---
FLPWork	-0.17	-0.18	---
FLPTotal	-0.04	-0.09	---
Patient COPE			
Active1	0.43	0.07	0.07
Active2	0.49*	-0.02	0.19
Passive	-0.32	-0.18	0.07

\* =  $p < .05$

*Functional limitations in the patient.* Functional limitations in the patient were predicted to be negatively correlated to relationship satisfaction in the partner. As Table 5 shows, in the diabetes group, correlations were either small and positive, or small and negative, and were in no case significant. A similar pattern was seen in the OOS group, except for a positive correlation between recreational limitations and partner satisfaction ( $r = .42$ , n.s.).

## 2.4 Multiple regressions

The general purpose of multiple regression is to analyse the relationship between several independent and a dependent variable (Howell, 2002).

In this study, step-wise multiple regression analyses (Howell, 2002) were computed to find the measures that would most adequately predict patients', and partners' relationship satisfaction. The DAS was chosen as the predicted variable in order to examine more thoroughly the focus of the study: dyadic satisfaction in chronic pain patients and partners. Also, only the OOS partners and patients were considered at this stage of the analysis because of the previous correlational data only showing minimal associations for the diabetes and control groups.

In order to select the predictor variables, the variable with the highest correlation with the predicted variable was entered first. Then semipartial correlations were calculated for the rest of the variables. The variable with the highest semi-partial correlation was the next one entered. If a variable did not produce a significant increment in  $R^2$ , it was removed from the equation. If a variable was added, and caused an existing variable to drop below significance, the semi-partial correlations were examined, and the variable with the lowest one was dropped from the equation. The adjusted  $R^2$  values were used, because they helped to take into account the small sample sizes.



### 2.4.1 Prediction of dyadic satisfaction in the patient

The first multiple regression used the patient DAS score as the predicted variable and the patient BDI, the FLP subscales, and Coping scales as the predictors. The BDI-II score was entered first (due to its high correlation with patient dyadic satisfaction ( $r = -0.72$ )). Next, semi-partial correlations were calculated for the remaining variables.

The variables were entered into the equation in this order: (1) Passive, (2) FLPComm, (3) FLPAAlert, (4) Active2, (5) FLPSoc, (6) FLPreC, (7) Active1, (8) FLPEmo, (9) FLPWork, and (10) FLPSleep.

The patient's dyadic satisfaction was best predicted by their BDI-II score, their FLPCommunication subscale score, their Active2 coping subscale score and their Passive coping scale score ( $\beta(\text{BDI-II patient}) = -.56$ ,  $\beta(\text{FLPComm}) = .439$ ,  $\beta(\text{Active2 patient}) = .249$ ,  $\beta(\text{Passive patient}) = -.31$ ,  $R^2 = .79$ ,  $F(4,15) = 18.99$ ,  $p < 0.01$ ). These four variables together explained 79% of the variance in patients' dyadic satisfaction. The best predictor of the patient's DAS score was their depression score, which explained 48.9% of the variance in their relationship satisfaction. Impairments in communication explained 39.78% of the variance by itself. Passive coping explained 22.17% and active coping (Active2) explained 13.37%.

The second multiple regression equation used the patient DAS score as the predicted variable and the patient BDI-II, FLP subscales (excluding FLPTotal) and the Coping scales, *and* the partner BDI-II and Coping scales as predictors. A separate regression equation was performed because it was assumed that the significant correlations found between the patient DAS and partner variables may mean that the partner scores contribute to explaining the variance (possibly over and above the patient variables) in the patient's dyadic satisfaction.

Again, the patient BDI-II score was entered first. Then semipartial correlations were calculated for the rest of the variables. For this equation, the variables were entered in this order: (1) FLPComm, (2) Passive partner, (3) BDI-II partner, (4)

Active2 partner, (5) Active1 partner, (6) FLPreC, (7) FLPEmo, (8) FLPSleep, (9) FLPSoc, (10) Active2 patient, (11) Active1 patient, (12) FLPAAlert, (13) FLPSoc.

The hypothesis was supported. When the partner scores were added, the patient's dyadic satisfaction was best predicted by their FLPSocial and FLPCommunication score, and the *partner's* BDI-II and Passive coping score ( $\beta(\text{FLPSoc}) = -.33$ ,  $\beta(\text{FLPComm}) = .423$ ,  $\beta(\text{BDI-II partner}) = -.32$ ,  $\beta(\text{Passive partner}) = .402$ ,  $F(4,15) = 28.674$ ,  $R^2 = .88$ ,  $p=0.01$ ). These four variables together explained 88% of the variance in patient's dyadic satisfaction. The best predictor of the patient's relationship satisfaction was the partner's BDI-II score, which explained 35.8% of the variance itself. Impairments in social and communication functioning explained 22.5% and 22.17% of the variance in the patient's relationship satisfaction, respectively. Passive coping in the partner explained 17.5% of the variance.

#### 2.4.2 Prediction of dyadic satisfaction in the partner

In order to predict partner dyadic satisfaction, the multiple regression equation used the partner DAS score as the predicted variable, and the partner BDI-II and Coping scales scores as the predictors. The partner BDI-II score was first entered into the equation. Then semi-partial correlations for the remaining variables were calculated.

For this equation, the variables were entered in the following order: (1) Active1, (2) Passive, (3) Active2.

The partner's dyadic satisfaction was best predicted by their BDI score and Passive coping score ( $\beta(\text{BDI-II partner}) = -.75$ ,  $\beta(\text{Passive partner}) = .49$ ,  $R^2 = .76$ ,  $F(2,17) = 31.02$ ,  $p<0.01$ ). These two variables together explained 76% of the variance in partners' dyadic satisfaction. The best predictor of the partner's DAS score was their depression level, which explained 51.5% of the variance itself. Passive coping explained 17.3% of the variance.

The final multiple regression equation used the partner DAS score as the predicted variable and the partner BDI-II and Coping scales scores, *and* the patient BDI-II, FLP subscales (excluding FLPTotal), and Coping scales scores as predictors. This equation was calculated to see if any of the patient variables helped to predict partner dyadic satisfaction, over and above the present partner variables. The BDI-II of the partner was entered first. Then semi-partial correlations of the remaining variables were calculated.

In this equation, the variables were entered in the following order: (1) FLPEmo, (2) Active1 patient, (3) Passive patient, (4) BDI-II patient, (5) Passive partner, (6) FLPSoc, (7) FLPSleep, (8) FLPWork, (9) Active2 partner, (10) Active1 partner, (11) FLPComm, (12) FLPreC, (13) Active2 patient, (14) FLPAAlert.

None of the patient related scores were significant predictors of the variance in the partner's dyadic satisfaction above and beyond the partner BDI-II and Passive coping scores (as outlined above).

In summary, it is quite clear that the partner BDI-II and Passive coping scores were the strongest predictors of dyadic satisfaction in partners. In addition, they were also significant predictors of patient dyadic satisfaction.

## 4. Discussion

### 4.1 Summary of Findings

The aim of this study was to assess the effects of chronic pain on relationship satisfaction, and to examine the effects of important moderating variables: depression, functional limitations and coping styles. Differences between participant groups (OOS, diabetes and control patients and their partners) were examined in order to investigate whether suffering from, or being the partner of, chronic pain (OOS) and/or illness (diabetes) was associated with a specific psychological profile, in terms of relationship satisfaction, depression and coping styles, in comparison to control individuals. In addition, the extent to which relationship satisfaction of OOS patients and their partners could be predicted from depression, coping and functional limitations scores was assessed. The results indicated considerable differences between both the OOS and diabetes groups and the control group on these measures, but similarities between the OOS and diabetes patients and partners. Moreover, within the OOS group, differences were found between the partners and patients on the majority of these measures.

The OOS patients were found to be higher on depression and passive coping than the control group. They were also more functionally impaired than the diabetes patients. Both the OOS patients and partners were found to be lower in relationship satisfaction and active coping than the control patients and partners.

The findings for the diabetes patients and couples were the same as the OOS patients and couples (except that the diabetes patients were less functionally impaired than the OOS patients).

For OOS patients, higher relationship satisfaction was associated with lower depression, limitations in social functioning and passive coping and higher limitations in communication functioning. Moreover, their partner's lower depression and use of passive coping was associated with higher patient relationship satisfaction. For OOS partners, higher relationship satisfaction was associated with lower depression, and higher active coping and passive coping. Moreover, lower OOS patients' depression

and higher OOS patients' active coping was associated with OOS partner's relationship satisfaction.

Important predictors of relationship satisfaction in the OOS patients were their own level of depression, limitations in communication and their use of active and passive coping. When their partners' (as well as their own) variables were considered, their partner's depression level and use of passive coping became better predictors of relationship satisfaction than their own use of active and passive coping. The OOS patient's limitations in social functioning became a stronger predictor than their own level of depression. Limitations in communication functioning remained an important predictor. The OOS partner's relationship satisfaction was best predicted by their level of depression and their use of passive coping.

## **4.2 Findings of This Study**

### *4.2.1 Hypothesis 1(a)*

The first part of hypothesis one predicted that relationship satisfaction would be lower in the OOS group than the diabetes and control groups. This was partly supported: the relationship satisfaction of the OOS group was lower than the control group, however, the diabetes group were also lower than the control group. This remained the case even after the differences between the groups in terms of age and length of time in relationship were taken into account. The finding that the OOS group had poor relationship satisfaction compared to the control group was consistent with previous research (eg., Payne & Norfleet, 1986).

All of the groups' mean scores lay in the normal range for relationship satisfaction; however, there was considerable variability within the groups. Almost half of the OOS patients and partners scored below the cut-off score of 100 on the DAS, indicating relationship dissatisfaction, which is consistent with previous research (eg. Flor, Turk & Scholtz, 1987). However, this was not specific to the OOS group. The diabetes group was very similar overall, and had similar numbers of people who fell in the dissatisfied range. In this sample, therefore, it appeared that

effects on relationship dissatisfaction were not specific to chronic pain, but were related to having a chronic health condition, which is a well-established finding in the literature (eg. Schmaling & Scher, 1997; 2000).

Of note, the distributions of scores on the DAS were different between the three groups. In the OOS group, a ‘floor’ effect was seen among low-scoring dyads, where partner scores did not decrease to the same extent as the patients did, indicating that the patients were more dissatisfied than the partners. The opposite pattern was seen in the diabetes group. In the control group, the scores were almost all clustered in the satisfied range for both patients and partners. However, it is important to note that the distributions of scores is only a trend, and further analysis of a larger sample would be needed to confirm these trends seen in the present sample. Overall, having a chronic health condition appeared to be associated with greater *variability* in relationship satisfaction, as well as the possibility of greater dissatisfaction. This indicates that being dyadically dissatisfied is not inevitably associated with having a chronic health condition (i.e., the relationship satisfaction of *some* dyads was high), perhaps indicating the importance of the moderating factors.

#### 4.2.2 Hypothesis 1(b)

It was predicted that the OOS partners would have lower levels of relationship satisfaction than the OOS patients; however, this was not the case. In the OOS group, mean relationship satisfaction was very similar between patients and partners. This findings is inconsistent with Flor, Turk & Scholtz (1987), who found that spouses were more dissatisfied than pain patients. However, the Flor et al. (1987) study used *male* chronic pain patients and female spouses (compared with the present study that used female pain patients and male partners). Therefore, a possible reason for this inconsistency is sex-related differences in relationship satisfaction, as discussed below. It must first be noted that any differences between patients and partners in this study will inevitably have the potential to be confounded with sex, because all of the patients were female, and all of the partners were male.

Some researchers have noted a tendency toward a greater number of females being dissatisfied with their marriages than males (Fowers, 1991; Bermas, Tucker,



Winkelman & Katz, 2000); however conflicting results have been found (Clements, Cordova, Markman & Laurenceau, 1997). If this were true, the hypothesis that partners should be more dissatisfied than patients could be skewed by the added patient dissatisfaction contingent upon their sex. However, there were similar levels of relationship satisfaction between patients and partners in the control group, indicating that the tendency for females to be more dissatisfied was not having a strong influence on this group, and therefore probably not in the OOS group either. In summary, the dyadic satisfaction of the OOS and diabetes group was considerably lower than the control group, and did not appear to be affected by sex-related differences.

#### *4.2.3 Hypothesis 1(c)*

The third part of hypothesis one predicted that depression would be higher in the OOS group than in the diabetes and control groups. Again, this was only partially supported. The OOS patient group were considerably more depressed on average than the control group, reporting a mean score in the threshold between mild to moderate depression. Over half of the OOS patients were moderately to severely depressed, which is consistent with previous research on chronic pain populations (Polatin et al., 1993; Lindal, 1990; Flor et al., 1987; Lee et al., 1993). However, there was no statistically significant difference between the OOS and diabetes patient groups (who were, on average, at the top end of the minimal severity range). While the focus of the study is not on diabetes patients, this is consistent with previous research (Lustman et al., 1997). Moreover, it highlights again that a chronic health condition (as opposed to chronic pain specifically) is associated with negative emotions, including depression.

The OOS partner group's average level of depression was similar to that of the diabetes partner group and control group, in disagreement with the hypothesis that OOS partners would have higher levels of depression than the diabetes and control groups. This is in contrast to previous research examining mood in partners (eg. Chun et al., 1993; Revenson & Majerovitz, 1991). It is of note that the range of scores for the OOS partners was large, indicating that at least a few of the partners were moderately to severely depressed, which is more in line with the previous research in this area.



Interestingly, after controlling for depression, the differences in relationship satisfaction between the three groups disappeared. This may provide some support for Coyne's (1976b) interpersonal theory of depression, namely that depression in one person can result in changes in the interpersonal dynamics of their relationship. However, caution must be noted when considering this finding, given that the direction of cause and effect could be in the opposite direction, i.e., relationship dissatisfaction leads to depression in patients and partners.

A factor which may have affected depression scores in this sample was the sex of the participant groups. It is well established that depression occurs about twice as often in women as men (Davison & Neale, 1998). Therefore, one might expect the OOS patient group to be more depressed than their partners, regardless of the effects of chronic pain. In accord with this view, previous research has indicated that women with chronic pain are more likely to be depressed than men with chronic pain (Meana, 1998), demonstrating the association between chronic pain, sex and depression. Moreover, Magni, Moreschi, Rigatti-Lucini & Mersky (1994) found a strong association between female gender and depression in the development of chronic musculoskeletal pain. However, some researchers (Fishbain, 2000) have argued that if sex influences the development of depression, independent of chronic pain, depression should be twice as common in female chronic pain patients as it is in male chronic pain patients. Fishbain (2000) asserts that this is not the case. Obviously, this area requires further investigation. In the present study, there were no differences in the level of depression between control partners and patients, which indicates that the depression may be associated more with the chronic health condition than the sex of the participants.

#### *4.2.4 Hypothesis 1(d)*

It was predicted that the OOS patients would be more impaired than the diabetes patients in areas of daily living, including recreation, socialising, emotion, alertness, sleep, communication and work. This hypothesis was supported. There were statistically significant differences between the two groups in every area except for work, where both were highly impaired. These results indicate that pain is likely to

result in more restrictions in the above-mentioned areas than a chronic health condition without pain. The OOS group were most affected in the areas of work, alertness and recreation. Future research may be valuable in this area with a larger sample size and OOS patients of both genders.

Given that activity limitation has been shown to mediate between chronic pain and depression (Williamson, 2000a), the discrepancy in level of depression between the OOS and diabetes patients was examined, with differences in activities controlled for. After the differences in functional limitations between the two groups were taken into account, the level of depression became very similar both groups, and fell in the mild range. This indicates that the extent of limitations exerted a strong effect on the level of depression in OOS and diabetes patients.

#### *4.2.5 Hypothesis 1(e)*

It was hypothesised that levels of active coping would be higher in the control and diabetes groups than the OOS group. This hypothesis was partially supported. With regard to the first active coping measure (Active1 subscale), the control group used a great deal more active coping than the OOS group. However, there were no differences in the levels of active coping used between the OOS and diabetes groups. There was also no difference in the amount of active coping used between patients and partners. These results indicate that active coping is used less in dyads with a chronic health condition than in dyads without a chronic health condition.

Unexpectedly, the second active coping scale (Active2) showed a different pattern of results. The control group used considerably more active coping than the diabetes group, but did not use more than the OOS group. Moreover, the patients were on average were higher than the partners. However, the differences between the groups, and the patients and partners, disappeared when the age of the partners were taken into account (see below). Therefore, contrary to expectations and unlike the other active coping scale, there were *no* differences between dyads with or without a chronic health condition in this sample.

The reason for this may be that the Active1 and Active2 subscales measure slightly different approaches to active coping. The Active1 subscale is more focused on problem solving efforts such as planning and getting advice on how to remove the stressor, carrying out the plan, trying to view the stressor more favourably and accepting the stressful event. The Active2 subscale is less obviously linked to active coping, and involves seeking emotional support, not letting other activities get in the way, and not using coping efforts until they will be effective. Therefore, it seems that the OOS dyads carried out the “style” of active coping measured by the Active2 subscale, but that having a chronic health condition meant that they didn’t use the “style” of active coping as measured by the Active1 subscale (or vice versa), compared to dyads with no health concerns.

#### 4.2.6 Hypothesis 1(f)

It was predicted that the OOS group would use higher levels of passive coping than the diabetes and control groups. This hypothesis was partially supported. The mean of the control group was a great deal lower than the mean of the diabetes group, but not the OOS group, *before* the length of time the couples had been in their relationship had been controlled for. After this was taken into account, both the OOS and diabetes groups scored higher on passive coping than the control group. There was also a consistent pattern of the patient groups using higher levels of passive coping than the partner group did. This indicates that having a chronic health condition is associated with using higher levels of passive coping.

There are several sources of intrinsic variability on coping that may have affected these results. It has already been noted above (when discussing active coping) that differences in age between the groups were having an effect on the results. This was especially so for the diabetes group who were, on average, significantly older than the OOS and control groups. Findings from cross-sectional studies have suggested that age differences in coping exist among young, middle-aged and elderly people when dealing with everyday life situations and medical illnesses (Strack & Feifel, 1996). Guttman (1987; cited in Strack & Feifel, 1996) suggested that individuals are inclined to move from active coping in early adulthood to passive coping beginning at age fifty. In the present study, both of the active coping scales

were negatively correlated with age, indicating that as the participants got older, their use of active coping strategies got lower. However, there was no evidence that passive coping got *higher* with age, perhaps indicating that passive coping stays fairly stable throughout the lifespan. This indicates that the high levels of passive coping found in the OOS and diabetes patients were due to their health, rather than their age.

Another factor that may have affected the types of coping used, was sex. A consistent finding across all coping studies is that women are more likely to seek emotional support than men are (Tamres, Janicki & Helgeson, 2002). Because the second active coping scale contained an item called “seeking emotional social support” and the passive coping scale contained an item called “focus on and venting of emotions”, it is possible that sex biases have inflated the scores. While there is no evidence for this in the Active2 coping scale (where men and women were equal), it is possible that this inflated the women’s score on the passive coping scale.

A further important sex effect found by Tamres et al. (2002) is that women are more likely than men to use *any* coping strategies (active *or* passive). Therefore, it is possible that sex-related differences inflated the patients’ scores on all of the active and passive coping scales. If this were the case, the patient group (women) would have been lower on active coping measures than their partners (men) without this confound of sex. Moreover, partners and patients may have demonstrated equal amounts of passive coping. It is clear that further research is needed in this area, using men as patients as well as women, and comparing the two. Additionally, there must be caution in ascribing any effect on coping as being wholly due to health problems in the present study.

An important additional point regarding coping is that it has been found to be associated with education level (Mercado et al., 2000). Higher education levels have been found to be associated with possessing a greater quantity of coping resources (Beck, 1996), being more likely to use active coping strategies (Mercado et al., 2000), and expecting a more realistic outcome (Arnesen & Wootton, 1991). Because this study did not control for education, it is possible that this affected the results of the diabetes group (who were, on average, less highly educated than the OOS and control groups). Therefore, it can be speculated that the OOS patients may have been lower

than diabetes patients on active coping and higher on passive coping, indicating that there are specific effects of chronic pain, distinct from those of chronic illness.

#### *4.2.7 Hypothesis 2*

The second hypothesis posited that:

- (1) depression in the patient or partner would be negatively correlated to relationship satisfaction;
- (2) functional limitations in the patient would be negatively correlated to relationship satisfaction;
- (3) active coping in the patient or partner would be positively correlated to relationship satisfaction; and
- (4) passive coping would be negatively correlated to relationship satisfaction.

With regard to the OOS patients, this hypothesis was mainly supported but with two notable exceptions. The first was that a strong positive correlation was found between impairment in communication and relationship satisfaction. In other words, the more difficulty an OOS patient had in communicating, the better their relationship satisfaction was. This is inconsistent with previous research on dyadic satisfaction, which emphasises the role of communication as a determinant of a couple remaining happy together (eg. Halford et al, 1997; Thomas & Taylor, 2002).

Several factors might account for this. In accord with the present study, James and Large (1992) found that people with chronic pain did not discuss it with their “closest other”. In addition, psychological distress in individuals has been associated with their spouse being pessimistic about progress, and seeing the patient as disabled and distressed (Block & Boyer, 1984; cited in James & Large, 1992). It follows that distress in one spouse is likely to lead to relationship dissatisfaction in both partners. Therefore, the impairment in communication could be an effort by the pain patient to protect the partner from distress, thus maintaining a happier relationship. It is therefore probable that pain patients who are likely to do this will be happier in their relationship and wish to maintain it, thus explaining the association between communication impairment and relationship satisfaction.



The same positive correlation was found with diabetes patients, but was considerably weaker, suggesting that the communication impairment effect may be specific to chronic pain. A possible reason for this is that pain is a very private experience that cannot be objectively measured by another individual. On the other hand, diabetes is a disorder with a known medical basis, and the causes of symptoms can be measured (eg. insulin readings). Therefore, individuals may find it more difficult to communicate about symptoms of pain with no objective evidence to support them (for fear of disbelief or ridicule) than individuals with diabetes.

The second unexpected finding was that passive coping in the OOS partner was positively associated with relationship satisfaction in the OOS patient. In other words, the more the partner used passive coping strategies, the better the patient's relationship satisfaction was.

This result may provide some support for the partner interaction model, mentioned in the introduction. According to the compensatory interaction model, one partner's use of active coping can compensate for the other partner's low use of that strategy (Berghuis & Stanton, 2002). Given the associations between passive coping and depression (Tennen et al., 2000; Weikgenet et al., 1993), and the fact that depression was strongly negatively associated with relationship satisfaction in the present study, it is possible that OOS patients who were satisfied in their relationship used active coping strategies. Therefore, according to this model, the use of passive coping strategies by the partners of 'active coping' patients would not reduce relationship satisfaction. This is consistent with Revenson (1995) and Berguis and Stanton (2002), who found a link between complementarity in coping and better adjustment.

There were no strong associations found between relationship satisfaction, depression, functional limitations and coping styles in the diabetes and control patients. This suggests that the powerful associations found in the OOS group are specific to chronic pain, rather than a chronic health condition. It is possible that depression, functional limitations and coping styles are less relevant to relationship satisfaction in diabetes patients because it is one of the rare chronic diseases that allow patients to control (to a large extent) their own well-being (Maes et al., 1996).

In contrast, OOS sufferers have less insight into how their pain might progress in the future, which may make these factors more salient.

When the correlates of relationship satisfaction in the OOS partner were examined, the majority of the hypotheses (of hypothesis two) were confirmed. Exceptions included passive coping, which was strongly positively associated with satisfaction in the OOS partner group. This appears to provide support for the partner interaction model mentioned above because, the active coping scales for the patient were strongly positively associated with relationship satisfaction in the partner. This also illustrates that it is important for a partner that the patient actively copes with pain. It is possible that this minimises distress and depression in the partner (as well as the patient), thus leading to a happier relationship.

The pattern found in diabetes and control patients was similar to that of their partners. None of the variables in question were strongly correlated with relationship satisfaction. Again, this seems to highlight the fact that depression, functional limitations and coping styles are much more salient for relationship satisfaction in OOS couples than in diabetes couples, or couples with no health concerns.

#### *4.2.8 Hypothesis 3*

The third hypothesis was based on previous research (eg. Kerns & Turk, 1984), and the interpersonal theory of depression (Coyne, 1976b); it stated that depression would be the strongest predictor of relationship satisfaction in OOS patients and partners. This was confirmed. In the OOS patients, relationship satisfaction was best predicted by their depression levels. However, there were three other important predictors of relationship satisfaction in the OOS patient group: namely limitations in communication, active coping, and passive coping. The relationship of depression to patient dyadic satisfaction was negative, which is consistent with previous research in this area (Kerns & Turk, 1984; Schwartz & Slater, 1991), and the interpersonal theory of depression (Coyne, 1976b).



Limitation in communication was also an important predictor of relationship satisfaction in the OOS patient. This may be for the reasons mentioned above, ie. an effort of the patient to protect the partner from distress, leading to a happier relationship. Another possible explanation involves the partner's reactions to the patient's reports of pain. As mentioned in the introduction, solicitous and negative reactions by significant others have been identified as potential reinforcing and punishing responses that may influence patient pain behaviours (Romano et al., 2000). Solicitous responses may lead to pain behaviours and disability in excess of what is expected, affecting the patient's mood and coping abilities, and thus affecting relationship satisfaction. Negative partner reactions are likely to have a direct effect on the relationship satisfaction of the patient. Therefore, it may be that a pattern of *not* discussing the pain problem is the best way of maintaining a happy relationship in OOS patients. Dorland & Hattie (1992) found a similar phenomenon in OOS patients, with one writing "I try not to mention it because my family were so helpful to me when I was at my worst... I'm reluctant to keep asking for help forever" (p.49).

Because a number of researchers have found that the ability to communicate effectively is an important positive correlate with relationship satisfaction, it is obvious that the finding needs to be investigated with further research.

The finding that active coping was positively related, and passive coping was negatively related to relationship satisfaction is consistent with previous research. Active coping has been linked with more favourable outcomes in chronic pain patients, and less depressive symptomatology (eg. Mercado et al., 2000; Brown & Nicassio, 1987; Affleck et al., 1992). It seems logical that this would lead to better relationship satisfaction. On the other hand, passive coping has been linked to depression (Weikgenet et al., 1993; Tennen et al., 2000), and a less favourable adjustment to chronic pain (Brown & Nicassio, 1987; Tennen et al., 2000). This would then lead to relationship dissatisfaction, an association which has indeed been found by other researchers (Kerns & Turk, 1984; Manne & Zautra, 1989). This finding also suggests that the complementary partner interaction model is related to better adjustment in chronic pain dyads only when the patient uses *active* coping and the partner uses passive coping, not vice versa.

It was interesting that when the partner variables were included in the regression, partner level of depression and degree of passive coping predicted the patient's relationship satisfaction over and above the patient's level of active and passive coping. Moreover, limitations in social functioning in the patient became a more significant predictor of their dyadic satisfaction than their level of depression. However, it must be noted that depression and social functioning shared very similar amounts of variance, which is not surprising since withdrawal from social activities is one of the first symptoms of depression. Limitations in communication remained a strong predictor of relationship satisfaction in the patient.

The relationship of social functioning limitation to the patient's dyadic satisfaction was negative; that is, the more impaired their social functioning was, the lower their relationship satisfaction. Clements et al. (1997) suggested that women's relationship satisfaction is determined by two main elements. The first is their overall happiness in marriage, lack of regret in marrying, and the amount of agreement on issues of displays of affection and sex. The second is the way the couple interacts with other people outside the home. Thus, if this second dimension is impaired, it is likely to affect the relationship satisfaction of women.

Research has also found that women tend to be more oriented to relationships than men (Clements et al., 1997). It is possible that this is part of the reason for the fact that the partner's depression and levels of passive coping were more important predictors of the women's relationship satisfaction than their own levels of active and passive coping. However, this is purely speculation, given that the findings for patients and partners may be confounded by sex differences.

As expected, the partner's level of depression was negatively related to the patient's relationship satisfaction. This is consistent with the interpersonal theory of depression (Coyne, 1976b), and previous research in this area (Skevington, 1995; Feuerstein et al., 1985; Schwartz & Edhe, 2000; Bigatti & Cronan, 2002). Moreover, the negative relationship of depression to patient satisfaction suggests that well-adjusted marriages may have partners with low or normal levels of depression (e.g., Revenson & Majerowitz, 1991). It was interesting that the partner's level of passive coping was a positive predictor of relationship satisfaction in the patient. The negative

association of patient passive coping, and the positive association of partner passive coping, to the relationship satisfaction in the patient seems to provide further support for the complementary partner interaction model (Berguis & Stanton, 2002), outlined above.

In contrast to the patient, their own level of depression and of passive coping best predicted the partner's relationship satisfaction. None of the patient variables helped to predict relationship satisfaction in the partner. The partner's levels of depression and passive coping have already been discussed above, in the context of the patient's relationship satisfaction.

In summary, the present study has indicated that depression, limitations in communication and social functioning and the extent of active and passive coping used by chronic pain patients are strongly associated with their relationship satisfaction. On the other hand, only depression and extent of passive coping are strongly associated with dyadic satisfaction in chronic pain partners. This highlights the importance of cognitive and emotional factors to partners' dyadic satisfaction, when compared with the effect of the limitations imposed on them by the patient's pain problem.

#### **4.3 Limitations and Directions for Future Research**

There are some important limitations that may have affected the findings of the present study. The first is that the length of time that people with OOS and diabetes have had their illness was not known (beyond the fact that it was more than six months). It is obvious that adaptation to a chronic health condition may differ depending on whether it is of recent onset or not (eg. one year vs 20 years). It may also differ according to other stressors in the individuals' life unrelated to the pain, such as problems with children, money, work stressors, etc. For example, Dhooper (1983; cited in Turk et al, 1987) found that most families reported feeling stronger as a unit after having dealt with heart disease in one of their members. Initially however, the family's emotional health was severely affected by the illness, with high anxiety levels found in spouses. Therefore, the length of time that the patient had suffered

from the illness may have been important with regard to mood and developing coping skills. It is important that this information be collected in future research of this type.

Another limitation with this study was the lack of information on relationship adjustment and satisfaction prior to the onset of health problems. It was not known in the present study whether the relationship dissatisfaction in the OOS and diabetes couples was a consequence of a chronic health condition or involved an exacerbation of pre-existing relationship distress. It was also unknown whether patients had their condition before or after coming into the relationship, which has implications for the amount of adjustment the couple may have had to make. Therefore, it is important that this be addressed by future research.

Because of the cross-sectional nature of the research, it is not possible to come to any conclusions regarding causality. Therefore, more research is required on the influence of depression, functional limitations and coping as moderating factors between chronic pain and relationship satisfaction. For example, while some investigators have focused on relationship satisfaction as a moderating factor between chronic pain and depression (eg. Kerns & Turk, 1984), or between chronic pain and pain behaviours (eg. Flor, Kerns & Turk, 1987; Romano et al., 2000), as yet no literature clearly examining directions of causality is available.

Unfortunately, most of the research on adaptation to chronic pain is cross-sectional, like the present study. Tennen and Affleck (1996) have advocated a longitudinal (idiographic-nomothetic) method, which would allow researchers to examine individuals *over time*. In other words, a time-intensive idiographic design would allow the investigator to: (a) examine proximal stressors and coping efforts closer to their actual occurrence; (b) track change in rapidly fluctuating processes, such as mood and pain, closer to their “real time” moments of change; and (c) minimise recall error associated with most measurement approaches to stress and coping. In relation to the present study, this would allow an investigator to assess associations between patient pain behaviours and partner responses, similar to Romano et al. (2000).

In general, there is an urgent need for longitudinal research in the chronic pain area (as compared to further cross-sectional studies). While it is useful to know that certain variables are associated with others (e.g., chronic pain and depression), longitudinal research would allow investigation into causality, which could then provide valuable information for treatment programs. Without this, it is possible that chronic pain patients will be treated for symptoms rather than causes. Moreover, longitudinal research would allow investigators to track changes over time and observe proximal influences on chronic pain and relationship, as they occurred. It would also enable different treatments to be evaluated.

One proximal influence requiring further investigation is the types of coping strategies used by chronic pain couples and the relationship of this to chronic pain and relationship satisfaction. This requirement is emphasised by the unexpected finding in the present study that passive coping in the partner was strongly associated with relationship satisfaction. It is possible that chronic pain couples benefit from different types of coping styles than couples with no health concerns. More research is needed to investigate this.

Another limitation of this study involves the selectivity of the sample. Men who had the greatest difficulty in dealing with their partner's OOS or diabetes may have already separated from their partner (this was the case for one respondent who emailed me). The couples that were willing to participate in research may not be generalisable to couples in the wider population. For example, some of the potential subjects who did not return their questionnaires may not have done so because their partners did not wish to participate. This might imply a degree of relationship disruption. As such, the sample may be biased towards more intact relationships, giving an inaccurate picture of the impact of chronic pain on intimate relationships.

This study also suffers from the limitations implicit in a self-report survey. In general, replies from subjects about their thoughts in certain past situations may well be different from what they would report were they able to do so in the immediate circumstance (Davison & Neale, 1998). For example, Tennen and Affleck (1996) maintain that coping efforts are best measured close to when they occur. Most research, however, measures coping efforts retrospectively.



Weiss and Heyman (1996) pointed out that there can be a great difference between self-report assessments completed separately by two partners, and a conjoint interview. "A couple may appear on assessment to be 'statistically divorced', yet fail to make that degree of upset obvious in their interviews. Or, a couple may present themselves during the interview as inches away from a destructive divorce, yet show considerable evidence of marital strengths on their assessment devices" (Weiss & Heyman, 1996, p.17). Therefore, behavioural observations and video recording of couples' interactions and possibly their coping with stressors probably would have added valuable information to the present study.

It has already been mentioned that sex effects may have biased the results of this study with regard to marital satisfaction, depression and coping styles. On a more global level, there is some evidence to suggest that there may be differences in the responses of husbands and wives to an unwell spouse (Flor, Turk & Scholtz, 1987). Therefore, a replication of this study with male chronic pain patients and female partners, or an equal ratio of sexes, is needed. This would be particularly important for assessing depression and coping styles, where there are known associations with sex. While valuable information was gained in this study from the diabetes and control group, there were some systematic differences between the three groups. Therefore, an extension of the present study would also benefit from matching the couples in the three groups for factors such as age, education, length of time in relationship, and possibly extra variables such as length of time with the illness. In addition, a larger sample size (given that there were only 20 couples in each group), would be useful to validate the findings of the present study.

Future research could also focus on the areas of functioning that are impaired in chronic pain patients. It was clearly shown in the present study that patients with chronic pain were more functionally limited than patients with diabetes. Additional research could be carried out to see exactly which functional areas are most difficult for a person with chronic pain. This information may then be useful for both patients and partners, allowing them to adjust their expectations accordingly. In particular, more research should be carried out to investigate the unexpected finding that impairment in communication is associated with relationship satisfaction in OOS

patients. If this finding was replicated, it may have implications for treatment of chronic pain couple distress (given that most couple treatments use communication training as part of the package).

A note of caution must be made about generalising the effects found in this study to other chronic pain populations. An assumption was made in the present study that the lack of clear association between physical impairment and reports of pain meant that OOS could be compared with other chronic pain disorders. However, it is possible that the effects from the present study are not applicable to other chronic pain populations, but are specific to OOS. Specifically, OOS is a pain condition with a diagnosis, but no identifiable pathology. Other pain conditions can range from having a diagnosis and identifiable pathology (eg. rheumatoid arthritis) to having no diagnosis and no identifiable pathology (eg. non-specific joint pain). It is possible that the stress of having no diagnosis of an illness may impact upon mood, coping resources and intimate relationships. Whether the effects of pain vary according to the specific disorder is difficult to say at the present time: more comparison research is required.

Finally, studies need to be conducted on the *positive* features of a chronic pain patient's experience, that is, the factors that help them to adjust to their illness. Most of the research on chronic pain tends to focus on the negative aspects of chronic pain, such as depression and functional limitations. Future research is needed to examine chronic pain patients who are not depressed and who judge themselves to have adjusted to their pain, and find out what physical, psychological or social factors were helpful for them. In this way, a more holistic understanding of the pain patient's experience will be achieved, providing invaluable additional information which could be used to improve chronic pain treatment programs.

#### **4.4 Implications of this research**

It was notable that most of the findings for the diabetes patients and partners were similar to the OOS patients and partners. Specifically, diabetes patients were the similar to OOS patients with regard to depression and passive coping. Diabetes



patients *and* partners were similar to OOS patients and partners with regard to relationship satisfaction and active coping. These findings highlighted the fact that a chronic health condition (distinct from chronic pain specifically) was associated with certain negative psychosocial factors. The only real difference between OOS and diabetes patients was found when they were compared directly (as opposed to the control group), where OOS patients were more limited in their functioning than diabetes patients.

However, when associations between dyadic satisfaction in diabetes patients and partners, and the factors mentioned above (depression, limitations and coping), were examined, they were effectively unrelated. In contrast, strong associations were found in the OOS group between some of these variables and their relationship satisfaction. This suggested that factors other than the ones measured in the present study were important to the relationship satisfaction of diabetes patients and partners.

There are two main differences between OOS and diabetes that may assist in explaining this finding. The first is that diabetes is a chronic condition that allows the patient (to a large extent) to control their own well-being in contrast to chronic pain, where the patient may have little insight into how the disorder will progress. Secondly, diabetes is a condition with a known medical cause and visible symptoms, compared to OOS, which has no known pathophysiology and “invisible” symptoms (i.e., one cannot see the pain). Related to the “invisibility” of pain, it is common for chronic pain sufferers to feel that the legitimacy of their complaints are continually being challenged by health professionals (Allen, 1998). This stigma is one burden which diabetes patients do not have to contend with. It is obvious that more research is required to learn which psychosocial factors are related to relationship satisfaction in diabetes couples, especially in light of the findings from the current study (i.e., that relationship satisfaction was lower than controls).

It is clear, both from the current study and past research, that chronic pain is associated with disruption in intimate relationships. Causality is difficult to determine, i.e., does chronic pain cause relationship dissatisfaction or does a dissatisfied relationship exacerbate pre-existing pain. Whatever the direction of causality (and indeed a reciprocal relationship is possible), the present research has highlighted that:

- (1) Relationship satisfaction tended to be lower in couples where one partner had chronic pain or a chronic health condition compared to couples with no health concerns;
- (2) A chronic pain or a chronic health condition was associated with depression, and depression in the patient and/or the partner was related to relationship dissatisfaction; and
- (3) The types of coping strategies that both patients *and* partners used were associated with relationship satisfaction in OOS couples.

Point one emphasises that couple therapy may be indicated for couples where one partner has chronic pain. This could be emphasised by medical professionals who diagnose and treat the pain disorder (and possibly conducted as an adjunct to pain treatment).

A new treatment for couple distress could be especially useful for chronic pain couples. This approach is known as “integrative behavioural couple therapy” (IBCT; Christensen, Jacobson & Babcock, 1995; cited in Wheeler, Christensen & Jacobson, 2001). Rather than emphasising change as the primary goal (as in traditional behavioural couple therapy), the primary goal of IBCT is to promote each partner’s acceptance of the other and of their differences. IBCT aims to help the partners develop a new understanding of apparently irreconcilable differences and uses these differences to promote intimacy, empathy and compassion for one another (Wheeler et al., 2001).

Because chronic pain is by definition a long-standing problem, an emphasis on acceptance may be particularly useful for chronic pain couples. The present research has highlighted that the effects of chronic pain generally extend to the partner as well as the patient. Therefore, an understanding of the problems and challenges that their partner faces may be enlightening for the pain patient, and vice versa.

The second important finding of the present study confirms a well-established association between depression and chronic pain and verifies that depression in both the patient and partner is related to relationship dissatisfaction. This is not a new finding, but it is notable in that that much of the data in the present study supports

Coyne's (1976b) interpersonal theory of depression. For example, no differences were found in relationship satisfaction between the groups when depression was controlled for; depression in the patients strongly predicted their own relationship satisfaction; depression in the partners strongly predicted their own and the patients' relationship satisfaction.

If depression was found in either the patient or partner during an assessment of a chronic pain couple who were experiencing relationship distress, interpersonal psychotherapy (IPT; Klerman, Weissman, Rounsaville & Chevron, 1984) might be particularly useful as a treatment paradigm for depression. The goals of IPT are to decrease depressive symptoms and to improve interpersonal functioning, by enhancing communication skills in significant relationships (Klerman et al., 1984). Moreover, IPT focuses on four major areas: (1) grief (this only applies to the death of a person, so is not necessarily relevant to chronic pain), (2) role disputes in relationships, (3) transitions (often involving role changes resulting from life events) and (4) interpersonal deficits (helping the patient increase the quality and quantity of interpersonal relationships; Gilles, 2001).

At least two of these four areas are extremely relevant to chronic pain couples. Role disputes and transitions are almost inevitable when one partner develops chronic pain; they are likely to involve the patient giving up activities (for example, employment, social and recreational activities). The partner may also take on added responsibility. IPT would allow the patient or partner to mourn the loss of the old role and accept the new role (Gilles, 2001). Thus, the utility of IPT for chronic pain couples where one partner has depression needs to be investigated. Following empirical validation, IPT could be conducted as an adjunct to pain treatment.

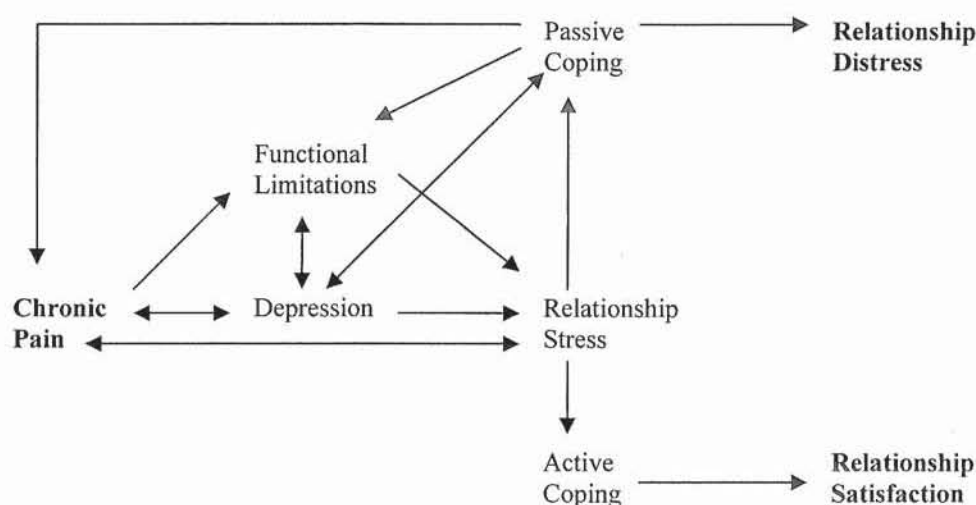
The final important finding from the present study is that coping styles in both patients *and* partners were linked to relationship satisfaction. Previous research has investigated coping in chronic pain couples, often focused on the ways in which the partner affects the patient's coping strategies; or, the association between coping strategies and psychological variables. In contrast, the present research highlights that the "fit" between a couple's coping efforts is associated with relationship satisfaction. In others words, the present research strongly supports a complementary model where

a patient's active coping efforts and a partner's passive coping strategies integrate to enhance relationship satisfaction.

This has interesting implications for treatment programs. Consistent with findings from previous research (e.g., Schwartz & Ehde, 2000), this study indicates that partners should be involved in the treatment of chronic pain. They should receive education about chronic pain and how they can best aid the patient, that is, to let the patients take control of their own life and learn how to cope with the pain themselves. While this may be counterintuitive to some partners (it could be perceived as a lack of caring or support), this approach seems to be associated with relationship satisfaction in the present study

#### 4.5 Conclusion

Figure 1 (as shown in the Introduction section) will be reconsidered in the light of the findings of the present study. As noted previously, Figure 1 was an attempt by the author to conceptualise the past literature and research findings in the chronic pain area.



**Figure 1.** Author's conceptualisation of associations between chronic pain and relationship satisfaction/distress and the moderating variables of depression, functional limitations and coping style.<sup>9</sup>

<sup>9</sup> This diagram is a hypothesis only. In particular, the arrows do not mean that causality has been established. Instead, the arrows are demonstrating the possible associations between chronic pain, depression, functional limitations, coping and relationship functioning.

The findings of the present study did appear to be mainly consistent with this figure. Chronic pain was associated with depression and functional limitations. Whether the relationship was distressed seemed to be strongly associated with the type of coping strategy used.

Higher passive coping by the patient was a strong predictor of relationship distress. Relationship distress, passive coping and depression were all associated with each other. This provides some support for a “feedback loop” between chronic pain, depression, relationship stress, passive coping and ongoing chronic pain. The role of functional limitations was less evident. Most limitations were not strongly associated with relationship distress and unexpectedly, limitation in communication was associated with relationship satisfaction.

Higher active coping by the patient and passive coping by the partner were strong predictors of relationship satisfaction. This finding emphasised *complementary* coping by patients and partners as being an important determinant of relationship satisfaction in chronic pain couples.

Overall, this study has shown that chronic pain is associated with negative psychosocial factors. However, depending on the coping strategies of *both* members of the couple it is possible for chronic pain couples to be happy and satisfied in their relationship.

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## Appendix 1

*Have you been diagnosed with Occupational Overuse Syndrome (OOS) or Repetitive Strain Injury (RSI) by your doctor at least 6 months ago?*

**Are you married or have lived with your partner for at least one year?**

I am looking for women diagnosed with Occupational Overuse Syndrome (also called RSI), and their spouses or partners, to take part in a research project examining the effects of pain on relationship satisfaction. You will simply need to fill out some questionnaires, which I will send to you.

For more information, please call Frances on (03) 3774127 or 021 132 5010, or email at [frw12@student.canterbury.ac.nz](mailto:frw12@student.canterbury.ac.nz)

*Everyone who fills in, and sends the questionnaires back to me, will go in a draw to win a gift basket worth \$100!!*

This research is being conducted on behalf of Mr Neville Blampied and Dr Lucy Johnson from the Department of Psychology, University of Canterbury. They can be contacted on 364 2199 and 3642967 respectively. The research has been reviewed and approved by the University of Canterbury Human Ethics Committee.

## Appendix 2

Wanted: Women diagnosed with Occupational Overuse Syndrome who have been married or living with their partners for at least one year, and your partners, to take part in a research project. All participants will go in a draw to win a free gift basket. For more information, please call Frances on (03) 3774127 or email [frw12@student.canterbury.ac.nz](mailto:frw12@student.canterbury.ac.nz)

## Appendix 3

***Do you have diabetes?***

**Are you married or have lived with your partner for at least one year?**

I am looking for women diagnosed with Diabetes, and their spouses or partners, to take part in a research project examining the effects of pain on relationship satisfaction. You will simply need to fill out some questionnaires, which I will send to you.

For more information, please call Frances on (03) 3774127 or 021 132 5010, or email at [frw12@student.canterbury.ac.nz](mailto:frw12@student.canterbury.ac.nz)

*Everyone who fills in, and sends the questionnaires back to me, will go in a draw to win a gift basket worth \$100!!*

This research is being conducted on behalf of Mr Neville Blampied and Dr Lucy Johnson from the Department of Psychology, University of Canterbury. They can be contacted on 364 2199 and 3642967 respectively. The research has been reviewed and approved by the University of Canterbury Human Ethics Committee.

## Appendix 4

Wanted: Women with diabetes who have been married or living with their partner for at least one year, and your partners, to take part in a research project. All participants will go in a draw to win a free gift basket. For more information, please call Frances on (03) 3774127 or email [frw12@student.canterbury.ac.nz](mailto:frw12@student.canterbury.ac.nz)

## Appendix 5

**Are you married or have been living with your partner for at least one year?**

I am looking for women, and their spouses or partners, to take part in a research project examining the effects of pain on relationship satisfaction. You will simply need to fill out some questionnaires, which I will send to you.

For more information, please call Frances on (03) 3774127 or 021 132 5010, or email at [frw12@student.canterbury.ac.nz](mailto:frw12@student.canterbury.ac.nz)

*Everyone who fills in, and sends the questionnaires back to me, will go in a draw to win a free gift basket worth \$100!!*

This research is being conducted on behalf of Mr Neville Blampied and Dr Lucy Johnson from the Department of Psychology, University of Canterbury. They can be contacted on 364 2199 and 3642967 respectively. The research has been reviewed and approved by the University of Canterbury Human Ethics Committee.



## Appendix 6

Wanted: Women who have been married or living with their partner for at least one year, and your partners, to take part in a research project. All participants will go in a draw to win a free gift basket. For more information, please call Frances on (03) 3774127 or email [frw12@student.canterbury.ac.nz](mailto:frw12@student.canterbury.ac.nz)

## Appendix 7

### The Effects of Chronic Pain on Intimate Relationships

You are invited to participate in a research project on the effects of chronic pain on intimate relationships. The aim of this project is to investigate how chronic pain affects how happy and satisfied people are with their relationship. Couples where one person has chronic pain will be compared with couples without chronic pain, and another chronic condition (diabetes), and people with no health concerns.

Your participation will involve the completion of four short questionnaires and will take about 45 minutes of your time. In return for your participation you will go in a draw to win a gift basket. If at any stage you do not wish to participate in the project, please do not feel obliged to send the questionnaires back to the researcher, or send the questionnaires with a note informing the researcher that you do not wish to take part in the project.

The results of the project will be reported in a Master's Thesis, and may be published in papers and conference proceedings, but your participation will be totally anonymous: the identity of participants will not be made public. To ensure anonymity and confidentiality, you are not asked to provide your name or any other identifying information on any of the questionnaires.

**By completing the questionnaires and returning them to the researcher, however, it will be understood that you have consented to participate in the project, and that you consent to publication of the results with the understanding that anonymity will be preserved.**

The project is being carried out by Frances Williams, under the supervision of Mr Neville Blampied, who can be contacted on 364 2199, and Dr Lucy Johnston, who can be contacted on 364 2967. They will be pleased to discuss any concerns you may have about participation in the project. Frances can be contacted on 3774127 or 021 132 5010.

**The project has been reviewed *and approved* by the University of Canterbury Human Ethics Committee.**

## Appendix 8

These details will be helpful for the researcher to organise the questionnaires, however please do not feel under any obligation to give the information below.

Age: .....

Ethnicity: .....

Length of time in current relationship: .....

Highest education level: .....

The number below will be used, upon completion and return of the questionnaires, as your draw number for a chance to win a gift basket worth \$100.

Please remember that these questionnaires must be done *separately* from your partner, so try to avoid comparing or discussing your answers.

## Appendix 9

### Between Group Analyses

#### *BDI-II*

A 2 x 3 between groups ANOVA revealed a significant main effect of group [ $F(2,114) = 14.39, p < .01$ ] and of participant [ $F(1,114) = 11.90, p < .01$ ]. This generated a significant interaction effect [ $F(2,114) = 6.13, p < .01$ ], and a post-hoc Scheffe test ( $p < .01$ ) revealed that the OOS patients were significantly higher in their depression scores than the other groups.

#### *DAS*

A 2 x 3 between groups ANOVA revealed a significant main effect of group [ $F(2,114) = 12.81, p < .01$ ], and a post-hoc Scheffe test ( $p < .01$ ) confirmed that the control group was significantly higher than the OOS and diabetes groups on their DAS scores. There was no main effect of participants and no significant interaction effect.

#### *COPE*

##### Active1

A 2 x 3 between groups ANOVA revealed a significant main effect of group [ $F(2, 114) = 7.23, p < .01$ ], and a post-hoc Scheffe test ( $p < .01$ ) revealed that the control group was significantly higher than the OOS and diabetes groups. There was no main effect of participant and no significant interaction effect.

##### Active2

A 2 x 3 between groups ANOVA revealed a significant main effect of group [ $F(2,114) = 4.70, p < .05$ ] and participant [ $F(1,114) = 4.55, p < .05$ ]. A post-hoc Scheffe test found that the control group was significantly higher than the diabetes group ( $p < .01$ ).

##### Passive

A 2 x 3 between groups ANOVA revealed a significant main effect of group [ $F(2,114) = 4.82, p < .01$ ] and participant [ $F(1,114) = 15.43, p < .01$ ]. This generated a significant interaction effect [ $F(2,114) = 3.12, p < .05$ ]. A post hoc Scheffe test ( $p < .01$ )

revealed that OOS patients were significantly higher in passive coping than their partners, and the control partners (but not the other participants).